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# ***JPRS Report***

# **Science & Technology**

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***USSR: Life Sciences***

9 JULY 1987

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## SCIENCE &amp; TECHNOLOGY

## USSR; LIFE SCIENCES

## CONTENTS

## AGRICULTURAL SCIENCE

- Effects of Double-Stranded RNA on Viral Plant Infections  
(G.K. Eglitye, L.T. Dzirkalye, et al.; IZVESTIYA  
AKADEMII NAUK LATVIYSKOY SSR, No 11, Nov 86)..... 1
- Isolation and Study of Rhizobium Leguminosarium Strains  
Effective on Afghan Peas  
(S.A. Chetkova, I.A. Tikhonovich; MIKROBIOLOGIYA,  
No 1, Jan-Feb 86)..... 2
- Chromosomal Localization of Genes Controlling Gliadin  
Biosynthesis in Soft Chinese Spring Wheat  
(S.Ye. Peltek, T.A. Pshenichnikova, et al.;  
GENETIKA, No 6, Jun 86)..... 2

## BIOCHEMISTRY

- Book on Immobilized Enzymes in Medicine  
(V.P. Torchilin; IMMOBILIZOVANNYYE FERMENTY V  
MEDITSINE [NOVOYE V ZHIZNI, NAUKE, TEKHNIKE: SERIYA  
"KHIMIYA"], No 9, Sep 86)..... 3
- Isolation of Cholesterol Oxidase From Non-Pigmented Strain  
of Streptomyces Lavendulae  
(A.A. Imshenetskiy, G.A. Kazakov, et al.; PRIKLADNAYA  
BIOKHIMIYA I MIKROBIOLOGIYA, No 4, Jul-Aug 86)..... 9

## BIOPHYSICS

- Magnetic Blood Cells  
(E.Ya. Blum, R.Ya. Ozols, et al.; IZVESTIYA AKADEMII  
NAUK LATVIYSKOY SSR, No 1, Jan 87)..... 10
- Triboluminescence of Electrolytes and Organic Components of  
Human Serum  
(V.A. Baraboy, V.E. Orel; DOKLADY AKADEMII NAUK  
UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE,  
KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI, No 2, Feb 87)... 10

## BIOTECHNOLOGY

- Vaccinia Virus as Vector for Genetically Engineered Vaccines  
and Role of Viral Protein Functions  
(VOPROSY VIRUSOLOGII, No 4, Jul-Aug 86)..... 12
- Preparation of Spheroplasts From Citrobacter Freundii Bacteria  
Cells  
(I.V. Tsyachnaya, K.I. Voyvodov, et al.; PRIKLADNAYA  
BIOKHIMIYA I MIKROBIOLOGIYA, No 4, Jul-Aug 86)..... 12
- Comparative Study of Conditions of Photoreduction of  
Acetylene by Anabaena Variabilis and Rhodopseudomonas  
Sphaeroides  
(Ye.N. Peletskaya, O.G. Polesskaya, et al.; PRIKLADNAYA  
BIOKHIMIYA I MIKROBIOLOGIYA, No 4, Jul-Aug 86)..... 13
- Selection of Escherichia Coli and Pseudomonas Putida Cultures  
With Elevated Stability Towards Immobilization Process in  
Polyacrylamide Gel  
(N.G. Starostina, K.A. Lusta, et al.; MIKROBIOLOGIYA,  
No 1, Jan-Feb 86)..... 14

## EPIDEMIOLOGY

- Influenza Morbidity in Kazakh SSR in 1977-1984  
(A.T. Ismagulov, M.Kh. Sayatov, et al.; VOPROSY  
VIRUSOLOGII, No 4, Jul-Aug 86)..... 15
- In Vivo and In Vitro Studies on Susceptibility of Patient-  
Imported Plasmodium Falciparum to Antimalarial Agents  
(Z.I. Glazunova, Yu.P. Gorbunova, et al.;  
MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI,  
No 6, Nov-Dec 86)..... 15
- Insecticidal Susceptibility and Irritability of Soviet  
Anopheles Mosquitoes. Part 1. Anopheles Pulcherrimus  
Theobald  
(N.I. Bondareva, M.M. Artemyev, et al.; MEDITSINSKAYA  
PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI, No 6,  
Nov-Dec 86)..... 16

Susceptibility of Different Mosquito Genera and Larval Stages to Bacterial Preparations (L.A. Ganushkina, A.A. Voytsik; MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI, No 6, Nov-Dec 86).....	17
Koutango Virus (Flavivirus Togaviridae) in Somalia (A.M. Butenko, I.V. Semashko, et al.; MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI, No 3, May-Jun 86).....	17
Tick-Borne Encephalitis (TBE) Virus Carrier Incidence Among Adult Ixodid Ticks (E.I. Korenberg, G.G. Bannova, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	18

## GENETICS

Analysis of Complementary Interrelationships of Mutations Induced by Synthetic Polynucleotides in Drosophila (Yu.N. Aleksandrov; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI, No 2, Feb 87).....	19
Transposition of Mobile Dispersed Genes in Mutation System Induced by DNA Administration in Drosophila (T.V. Shandala, V.A. Mogila, et al.; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI, No 2, Feb 87)...	20
Bacterial Genome Construction: New Advances in Genetic Engineering (V.V. Sukhodolets; GENETIKA, No 6, Jun 86).....	20
Characterization of Cloned Repetitive DNA Sequences of Barley Genome (Ye.V. Ananyev, S.S. Bochkanov, et al.; GENETIKA, No 6, Jun 86).....	21
Statistical Analysis of Abnormal Human $\alpha$ - and $\beta$ -Globins (Yu.Ye. Dubrova; GENETIKA, No 6, Jun 86).....	22
Genetic Control of Resistance to Brown Rust in Common Spring Wheat Varieties (N.A. Dorozhkin, et al.; DOKLADY AKADEMII NAUK BSSR, No 3, Mar 87).....	22



## HUMAN FACTORS

- Development of Regions With Harsh Climate  
(Vlaill Kazanacheyev; ADVANCES OF SCIENCE AND  
TECHNOLOGY, No 7, 5 Mar 87)..... 24

## IMMUNOLOGY

- Cytomegalovirus Infection and AIDS  
(N.A. Farber, V.M. Zhdanov; VOPROSY VIRUSOLOGII,  
No 4, Jul-Aug 86)..... 26
- Reactogenicity, Genetic Stability and Efficacy for Children  
of Live Recombinant Influenza Vaccine Constructed From  
Cold-Adapted A/Leningrad/134/47/57 Virus  
(G.I. Aleksandrova, T.Ye. Medvedeva, et al.; VOPROSY  
VIRUSOLOGII, No 4, Jul-Aug 86)..... 27
- Enhancement of Immunogenicity of Influenza Virus Surface  
Proteins by Their Inclusion in Liposomes  
(I.G. Kharitonov, N.G. Yaroslavl'tseva, et al.;  
VOPROSY VIRUSOLOGII, No 2, Mar-Apr 86)..... 27
- Indirect Immunoenzymatic Method for Laboratory Diagnosis  
of Lassa and Ebola Hemorrhagic Fevers  
(A.P. Ivanov, Ye.A. Tkachenko, et al.; VOPROSY  
VIRUSOLOGII, No 2, Mar-Apr 86)..... 28
- Production and Properties of Hybridomas Producing Monoclonal  
Antibodies to Tick Encephalitis Virus  
(A.A. Kushch, M. Novak, et al.; ACTA VIROLOGICA,  
No 3, May 86)..... 29
- Two Types of Monoclonal Antibodies to Tick Encephalitis Virus  
(S.Ya. Gaydamovich, Ye.E. Melnikova, et al.; ACTA  
VIROLOGICA, No 3, May 86)..... 29
- Thymus Independent Synthesis of Antibodies to Prowazekii  
Rickettsiae Antigen  
(Ye.A. Kabanova, E.D. Miskarova, et al.; ACTA  
VIROLOGICA, No 3, May 86)..... 30
- Effects of Size of Contiguous Poly(G) Region in Poly(G,A):-  
Poly(C) on Interferon Induction and Enhancement of Immunity  
(L.M. Vilner; VOPROSY VIRUSOLOGII, No 6, Nov-Dec 86)... 31
- Viral Hepatitis B and Immunodeficiency  
(VOPROSY VIRUSOLOGII, No 6, Nov-Dec 86)..... 31

Interferon-Inducing and Antiviral Activity of Maleic Anhydride Copolymers (N.N. Nosik, F.I. Yershov, et al.; VOPROSY VIRUSOLOGII, No 5, Sep-Oct 86).....	32
Problem of Treatment of Acquired Immune Deficiency Syndrome (VOPROSY VIRUSOLOGII, No 5, Sep-Oct 86).....	33
Effect of Placental $\alpha_1$ -Microglobulin on Proliferative and Cytotoxic Activity of Mice Lymphocytes In Vitro (L.N. Gulyanskiy, D.D. Petrunin, et al.; IMMUNOLOGIYA, No 6, Nov-Dec 86).....	33
Experimental Models of Acquired Immunodeficiency (R.M. Khaitov; IMMUNOLOGIYA, No 6, Nov-Dec 86).....	34
Physical-Chemical Characteristics of Bone Marrow Mediator Stimulating Antibody Formation (L.A. Zakharova, A.V. Katlinskiy, et al.; IMMUNOLOGIYA, No 3, May-Jun 86).....	34
Effect of Immobilization Stress on Formation and Activity of Humoral Immune Response Suppressors (B.A. Frolov, M.S. Blyakher, et al.; IMMUNOLOGIYA, No 3, May-Jun 86).....	35
Role of T-Lymphocytes in Primary Immune Response to Inactivated Foot and Mouth Disease Virus Administered to Mice (I.A. Lycheva, A.Ya. Kulberg, et al.; IMMUNOLOGIYA, No 3, May-Jun 86).....	36
Genomic and Antigenic Analysis of Influenza A (H1N1) Viruses Isolated in 1982-1983: Selection of Optimum Vaccine Strain (I.I. Akopova, A.I. Klimov, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	36
Monoclonal Antibodies Against Antigens of Japanese Encephalitis (JP) Virus (A.S. Novokhatskiy, I.V. Malakhova, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	37
Cytomegalovirus (CMV) Infection and Immunodeficiency (N.A. Farber, S.A. Demidova, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	38
Novel Perorally Effective Interferon Inducer (T.I. Yershov, A.M. Sayitkulov, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	38

Interferon Induction by Peroral Administration of High Molecular Weight Polynucleotides (S.S. Grigoryan, F.I. Yershov, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	39
New Data on AIDS and Its Etiologic Agent (VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	40
MEDICINE	
New Soviet Technique of Blood Vessel Correction (Anna Nikolayeva; ADVANCES OF SCIENCE AND TECHNOLOGY, No 7, 5 Mar 87).....	41
Cryoscalpel Development in USSR (L. Levitskiy; IZVESTIYA, 4 Mar 87).....	43
MICROBIOLOGY	
Microbiological Fermentation of Methane (S. Geoletsyan; KOMMUNIST, 15 Jan 87).....	44
Virus Lyophilization (V.V. Kadetov, V.V. Korol, et al.; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	45
Fluorescent Antibody Technique in Studies on Simbu Group of Bunyaviruses (V.V. Roldugina, L.L. Fadeyeva; VOPROSY VIRUSOLOGII, No 3, May-Jun 86).....	45
Suitability of RAMT Cell Line for Propagating Vaccine Virus Strains (V.P. Grachev, M.A. Zavalnyy, et al.; VOPROSY VIRUSOLOGII, No 6, Nov-Dec 86).....	46
Activation of Alphavirus Reproduction in Cell Culture by Alkaline pH (O.P. Zhirnov; VOPROSY VIRUSOLOGII, No 6, Nov-Dec 86)..	46
Biological and Certain Physical-Chemical Properties of Cornebacterium Diphtheriae B (Freeman) $\phi$ 984 and $\phi$ 9 phages (A.A. Kovgan, A.F. Bobkov, et al.; VOPROSY VIRUSOLOGII, No 5, Sep-Oct 86).....	47
Concentration of Venezuelan Equine Encephalomyelitis Virus in Two-Phase Water-Soluble Polymer System (V.G. Pomelova, S.Ya. Gaydamovich, et al.; VOPROSY VIRUSOLOGII, No 5, Sep-Oct 86).....	48

Effect of Mineral Salts on Formation of Exotoxins and Productivity of <i>Bacillus Thuringiensis</i> Culture (L.I. Abrosimova, P.V. Babayeva, et al.; MIKROBIOLOGIYA, No 3, May-Jun 86).....	48
Ability of Marine Bacteria To Biosynthesize Fibrinolytic Enzymes (N.S. Yegorov, N.S. Landau, et al.; MIKROBIOLOGIYA, No 3, May-Jun 86).....	49
Bacteria Decomposing Industrial Oils (Ye.G. Toropova, G.V. Matyusha, et al.; MIKROBIOLOGIYA, No 3, May-Jun 86).....	49
Sulfur Cycle Thermophilic Bacteria From Corrosion Zones of Steel Constructions in Municipal Heating Systems and in Soil (R.S. Golovacheva, Ye.P. Rozanova, et al.; MIKROBIOLOGIYA, No 1, Jan-Feb 86).....	50
Taxonomic Position of Microorganisms Isolated From Stratosphere and Mesosphere (A.A. Imshenetskiy, S.V. Lysenko, et al.; MIKROBIOLOGIYA, No 1, Jan-Feb 86).....	50
Bioluminescent Evaluation Method of Toxicity of Colored Substances in Effluent From Sulfate-Cellulose Industry (L.N. Novikova, T.A. Gil, et al.; MIKROBIOLOGIYA, No 1, Jan-Feb 86).....	51
Use of Microfiltration in Production of Inactivated Influenza Vaccines (N.B. Ivanov, V.P. Zhemkov, et al.; VOPROSY VIRUSOLOGII, No 4, Jul-Aug 86).....	52
Reduction of Infectivity of Enveloped Viruses With Retention of Specific Biological Activity of Viral Proteins (V.E. Berezin, A.F. Artamonov, et al.; VOPROSY VIRUSOLOGII, No 4, Jul-Aug 86).....	52
Chemical Mutagenesis and Use of Indirect Enzymic Criteria for Selection of <i>Bacillus Thuringiensis</i> Virulent Clones (V.S. Slavnova, A.D. Chigaleyshik, et al.; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 4, Jul-Aug 86).....	53
Effect of Some Factors on Biosynthesis of Alkaloids by <i>Claviceps CP II</i> (A.G. Kozlovskiy, T.F. Solovyeva, et al.; PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA, No 4, Jul-Aug 86).....	54



Isolation of Viral Strains of Hemorrhagic Fever With Renal Syndrome From Patients and Rodents on Cell Cultures (R.A. Slonova, T.I. Astakhova, et al.; VOPROSY VIRUSOLOGII, No 2, Mar-Apr 86).....	54
Changeability of Tick-Borne Encephalitis (TBE) Virus on Passage in Ixodid Ticks and Small Mammals (S.P. Chunikhin, I.N. Reshetnikov, et al.; MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI, No 6, Nov-Dec 86).....	55
Reproduction Characteristics of Influenza A Epidemic Viruses in Cell Cultures (I.N. Lavrentyeva, T.Ye. Medvedeva, et al.; ACTA VIROLOGICA, No 2, Mar 86).....	56
MOLECULAR BIOLOGY	
X-Ray Structural Study of Specific Inhibitor of Reverse Transcriptase 3'-Azido-2',3'-Dideoxythymidine (G.V. Gurskaya, Ye.N. Tsapkina, et al.; DOKLADY AKADEMII NAUK, No 4, Dec 86).....	57
PHARMACOLOGY, TOXICOLOGY	
Synergistic Therapeutic Effects of Aprotinin and Remantandine in Experimental Influenza (O.P. Zhirnov; VOPROSY VIRUSOLOGII, No 3, May-Jun 86)...	58
Effective Complexes of Antileukemic L-Asparaginase Enzyme With Dextrane Sulfate (A.S. Karsakevich, A.Zh. Dauvarte, et al.; VOPROSY MEDITSINSKOY KHIMII, No 4, Jul-Aug 86).....	59
Effects of Novel Antineoplastic Blastozole on Nucleic Acid Levels and DNA Synthesis in Cancer Cells (S.N. Chenenkaya, N.Ye. Kucherenko, et al.; DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI, No 2, Feb 87).....	59
Prophylactic Effectiveness of Epsilon-Aminocaproic Acid (EACA) on Influenza in Mice (L.Ye. Puzis, V.P. Lozitskiy, et al.; ACTA VIROLOGICA, No 1, Jan 86).....	60



## PHYSIOLOGY

- Effects of Double-Stranded RNA on Pacemaker Neuron Membrane Processes  
(R.A. Zakharyan, G.Ye. Rychkov, et al.; NEYROKHIMIYA, No 3, Jul-Sep 86)..... 61
- Effects of Neurohormones K and C on Levels of Arginase Activity in Rat Brain in Liver  
(K.A. Galoyan, M.A. Davtyan, et al.; NEYROKHIMIYA, No 3, Jul-Sep 86)..... 62
- Brain Synaptosome Membrane Proteins During Convulsions Caused by Elevated Oxygen Pressure  
(K.B. Sherstnev, A.K. Suleymanov, et al. VOPROSY MEDITSINSKOY KHIMII, No 4, Jul-Aug 86)..... 62

## PUBLIC HEALTH

- Interview With Chazov on Health Ministry's Problems, Goals  
(E. Chazov Interview; PRAVDA, 13 Apr 87)..... 63
- Micromed-Joint Soviet-Hungarian Enterprise  
(Aleksandr Kuzmin, Boris Kozlov; NEW TIMES, No 14, 13 Apr 87)..... 71
- Computer Health Diagnostic System  
(CMEA: ECONOMIC COOPERATION, No 3, 1986)..... 75
- CEMA Cooperation in Public Health  
(CMEA: ECONOMIC COOPERATION, No 3, 1986)..... 76
- Principal Results of Completion of Topical Program--Development and Implementation of Scientific Principles of Lasting Total Country-Wide Eradication of Malaria  
(V.S. Orlov, R.L. Kuznetsov, et al.; MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI, No 5, Sep-Oct 86)..... 82
- Heart Transplant Problems  
(V. Burakovskiy; LITERATURNAYA GAZETA, 18 Feb 87)..... 83
- Hospital Renovation and Public-Spirited Citizens  
(B. Shul'man; EKONOMICHESKAYA GAZETA, No 7, Feb 87).... 83

## VIROLOGY

- Trends and Prospects in Virology in Latvian SSR  
(R.A. Kukayn; IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR, No 11, Nov 86)..... 85

Use of Interferon Inducer in Prevention and Treatment of Acute Viral Diseases in Calves (V.Ya. Mozgis, Z.E. Anderson, et al.; IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR, No 11, Nov 86).....	85
--	----

#### CONFERENCES

First All-Union Conference on Neuropeptides: Their Physiological and Pathological Significance (Tomsk, November, 1985) (R.I. Kruglikov, A.V. Azaryan; NEYROKHIMIYA, No 3, Jul-Sep 86).....	87
--	----

#### MISCELLANEOUS

Development and Structure of Some Fouling Communities in Avacha Bay (V.V. Oshurkov; BIOLOGIYA MORYA, No 5, Sep-Oct 86).....	38
Fouling of Stationary Anchor Chains by Edible Mussels in Vostok Bay (Sea of Japan) (V.A. Brykov, M.Zh. Chernyayev, et al.; BIOLOGIYA MORYA, No 4, Jul-Aug 86).....	89

/9835

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EFFECTS OF DOUBLE-STRANDED RNA ON VIRAL PLANT INFECTIONS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 11, Nov 86  
(manuscript received 8 Jan 86) pp 104-107

[Article by G.K. Eglitye, L.T. Dzirkalye, G.Ya. Feldmanye and A.E. Duk,  
Latvian Order of the Red Banner of Labor Agricultural Academy; Institute  
of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences]

[Abstract] Trials were conducted with a Soviet double-stranded RNA (dsRNA) preparation to determine its effects on infection of tobacco plants *Nicotiana glutinosa*, *N. sylvestris* and *N. tabacum* by tobacco mosaic virus (TMV) and tomato aspermy virus (TAV). In the case of infection with TMV the dsRNA--derived from *E. coli* biomass--was shown to reduce the number of necrotic lesions by 56-80% on *N. glutinosa* and *N. sylvestris* plants in a dose-dependent fashion. Maximum reduction was obtained with 0.1-1.0 mg/ml dsRNA. Pretreatment of the leaves with 0.1-10% DMSO to increase permeability to dsRNA had no effect on the outcome. dsRNA was also effective in limiting infection of *N. glutinosa* with TAV, if the dsRNA was applied 1 h prior to infection with 0.05 mg/ml TAV. Protection was not obtained with higher concentrations of the virus. These observations confirm certain other studies indicating that dsRNA may under certain circumstances be an effective antiviral agent in plants, in addition to its function as an interferon-inducer in mammalian systems. Figures 1; references 10: 7 Russian, 3 Western.

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CSO: 1840/628

ISOLATION AND STUDY OF RHIZOBIUM LEGUMINOSARIUM STRAINS EFFECTIVE ON AFGHAN PEAS

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 1, Jan-Feb 86  
(manuscript received 24 May 84) pp 143-147

[Article by S.A. Chetkova and I.A. Tikhonovich, All Union Scientific Research Institute of Agricultural Microbiology, Leningrad]

[Abstract] Intensification of the symbiotic nitrogen fixation process and its application in agricultural industry depends on the sensitivity of leading legume cultures to inoculation with nodulating bacteria strains. Three *Rhizobium leguminosarum* strains were isolated from north-western USSR soils capable of nodulating resistant Afghanistan peas. Principal properties of these strains were investigated: virulence, effectiveness and competitiveness. Such strains can be used in combination with resistance genes to produce highly specific complementary pairs plant-strain assuring highly effective nitrogenization. Figures 2; references 13: 4 Russian, 9 Western.

7813/9835  
CSO: 1840/562

CHROMOSOMAL LOCALIZATION OF GENES CONTROLLING GLIADIN BIOSYNTHESIS IN SOFT CHINESE SPRING WHEAT

Moscow GENETIKA in Russian Vol 22, No 6, Jun 86 (manuscript received 26 Jun 85) pp 995-1001

[Article by S.Ye. Peltek, T.A. Pshenichnikova, B.I. Sarapultsev and O.I. Maystrenko, Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences, Novosibirsk]

[Abstract] Polyacrylamide gel electrophoresis of gliadin components was used to analyze the genetic control of each component of Chinese Spring wheat, with identification of the involved chromosome and its shoulder. The studies were conducted with the parental euploid line, 42 nullisomic-tetrasomic lines, and 41 ditelosomicclines of the soft wheat. Identification of 33 gliadin components was correlated with genes on the short arms of chromosomes 1A, 1B, 1D, 6A, 6B and 6D. These observations pointed to dose effects and the nature of the multiple control systems for gliadin in Chinese Spring wheat. Complete chromosomal localization of the genes was complicated by difficulties encountered in electrophoretic resolution of some components, especially the beta-fraction. Figures 1; references 22: 8 Russian, 14 Western.

12172/9835  
CSO: 1840/642

## BOOK ON IMMOBILIZED ENZYMES IN MEDICINE

Moscow IMMOBILIZOVANNYYE FERMENTY V MEDITSINE [NOVOYE V ZHIZNI, NAUKE, TEKHNIKE: SERIYA "KHIMIYA"] in Russian No 9, Sep 86, pp 1, 2, 3-5, 32

[Table of contents, annotation, introduction, and appendix from book by V. P. Torchilin, "Immobilized Enzymes in Medicine," Izdatelstvo "Znaniye," 27,320 copies, 32 pages]

## [Text] TABLE OF CONTENTS

Introduction	3
Immobilization of Enzymes	5
Classification and Sphere of Application of Immobilized Enzymes in Medicine	9
Soluble Preparations of Immobilized Enzymes	12
Insertion of Enzymes into Artificial Cells	17
Immobilized Enzymes for Local Application	21
Directed Transport of Preparations in the Body	23
Immobilized Enzymes for External Application	28
Immobilized Enzymes in Clinical Analysis	29
References	31
Appendix	32

## ANNOTATION

The booklet explains a new direction in modern biochemistry--the use of immobilized enzymes in medicine. It examines the general problems, the achievements, and the limitations of enzymatic therapy. Data are introduced on the medical applications of enzymes, attached to soluble and insoluble polymer carriers, in the structure of artificial cells. The booklet discusses the problems associated with the use of immobilized enzymes in blood-circulation apparatuses, as components of dressings, and as sensitive elements in clinical biochemical-analysis systems.

## INTRODUCTION

Practically all the biochemical reactions that contribute to what we call the body's metabolism are regulated (accelerated) by protein catalysts that are present in every living cell. Those catalysts are called enzymes. Enzymes are



complex biological macromolecules that have developed in the lengthy process of evolution. Some of them, along with the protein component, contain in their molecules groups or fragments of a different chemical nature, such as fats or carbohydrates, that are covalently or noncovalently bound.

Enzymes are distinguished from artificial, man-made catalysts, which, as most of us know, are widely used in modern industry, by two fundamental properties: first, high specificity and, second, a high level of effectiveness. By specificity we mean that an enzyme is capable of selectively accelerating the transformation of only a few compounds, or even a single solitary compound, among a large group of similarly structured compounds; that is, every enzyme in a living cell regulates only certain types of reactions or even only one reaction. The effectiveness of an enzyme consists in its ability to effect an extremely large number of individual interactions among reacting substances in a unit of time. Obviously, both properties are extremely important in the enzyme's performance of its biochemical functions.

A detailed examination of the various types of enzymes, along with the principles of their action, is not our intent. We will note only that the more we study enzymes, the more attractive their practical use becomes. It seems all the more natural that many technological processes in the pharmaceutical and food industries, in delicate organic synthesis, and in the monitoring of the environment developed as analogs of natural processes that can occur in the body with much higher speed and with more rapid results because of the presence of the proper enzymes.

Unfortunately, the practical use of enzymes has encountered major difficulties. The first of these difficulties is the complexity and expense associated with obtaining sufficient quantities of pure enzymes. Moreover, one must deal with the fact that enzymes, when removed from the natural microenvironment (where they are embedded in the structure of biological formations), rapidly become inactive. The inactivity can be caused by a change in the medium's acidity, in the temperature, or in the saline composition or, among the many other factors, by the presence of oxidizing agents or reducing agents.

There also exists a whole set of complications of another order that prevent enzymes from becoming "technological" catalysts. Nevertheless, the potential benefits that their practical application promises have led to the creation of an area of science whose goal is to clarify the mechanisms of action of enzymes, develop methods for protecting them from the most varied of inactivating influences, and create stable, long-acting, relatively inexpensive industrial catalysts. This field of modern biotechnology is called industrial enzymology, and its successes today are considerable. The subject of our discussion, however, will be only one of the directions taken by industrial enzymology--that which is associated with deriving enzymatic preparations for practical medicine.

Just what can enzymes contribute to medicine? Over the past 10-15 years, natural, physiologically active compounds, primarily enzymes, have been used increasingly as medicinal preparations in the treatment of digestive organs, cardiovascular diseases, tumors, wounds and burns, and viral infections. In

addition, physicians and researchers have paid more and more attention in recent years to the problem of controlling enzymopathies--disorders that are associated with a congenital deficiency of certain enzymes or with a disturbance of their normal action. We now know of several hundred such disorders, many of which are associated with the accumulation of metabolic waste products in the cells of the liver. Such disorders, as a rule, do not respond to traditional methods of treatment and can be corrected only by introducing the deficient enzyme into the body from without. In doing so, one must take especial pains to deliver the medicinal enzyme into precisely the cells in which the deficiency exists.

Thus, the development of medicine and biochemistry has enabled us to ascertain that the emergence of many serious disorders is related to disturbances in the enzymatic systems of the body, which means that enzymes capable of regulating metabolism can be used to treat these disorders. Today, there are dozens of medicinal preparations with an enzymatic base on the world market. They are derived from various sources of animal, vegetable, or bacterial origin. The most widely used are preparations for correcting digestive disturbances and for substitution therapy after surgery on the digestive organs, when the body's own enzymes are insufficient for the normal processing of food. Such preparations, as a rule, are mixtures of various digestive enzymes that are derived with relatively simple methods from the by-products of the dairy and meat industry.

Yet another large group of enzymatic preparations is designed to act on thrombi when the blood's own fibrinolytic (thrombolytic) activity is deficient. First, there are the enzymes that are themselves capable of acting on a thrombus and breaking it down (fibrinolysin). Second, there are the enzymes that are capable of activating the body's own thrombolytic enzymes (urokinase, streptokinase, and the tissue activator of plasminogen). Such preparations, manufactured in many countries around the world under various trade names, have already shown a high efficacy in the treatment of myocardial infarction and a variety of thromboses.

Proteolytic enzyme preparations (enzymes capable of splitting proteins) have found wide application in clinical practice. Such preparations destroy necrotic tissue and enable the thinning of viscous blood secretions and clots. They are rather widely used in surgery, in the treatment of wounds and burns, and for cosmetic purposes. The enzyme hyaluronidase, which splits, as its name would suggest, hyalonic acid, raises the penetration of tissue and destroys scar-tissue formation. Desoxyribonuclease, which is active in viral infections of the mucous membranes as well as of the upper respiratory tract and the lungs, has performed well in antiviral therapy. Enzymes such as arginase and asparaginase are employed in the treatment of certain types of tumors. The enzyme penicillinase, capable of splitting penicillin, eliminates the excess in the body when too much of the antibiotic is given or when there is an allergic reaction to its use. Thus, at first glance, the picture appears to be totally rainbow-colored.

Unfortunately, however, extensive, daily clinical use of enzymatic preparations is, in actuality, still limited. Traditionally, these limitations can be divided into two fundamental groups. First, the production

of pure enzymatic preparations is clearly developed insufficiently, and they are extremely expensive. In the solution of economic questions, great hope is placed on the development of biotechnology, in particular, on the management of the production of necessary enzymes by means of genetic engineering. Second, enzymes are highly complex and unstable protein structures, besides being foreign to the recipient's body. This lends itself to wide-ranging complications, primarily immunological, that usually accompany the use of enzymatic preparations.

Moreover, enzymes often have nonspecific toxicity (which can also be characteristic of the products of their biological breakdown in the body). They are rapidly destroyed by the body's own proteolytic enzymes and are eliminated from the bloodstream; circulatory inhibitors act on them naturally; and finally, they are simply inactivated by the acidity and the temperature of the medium. Unfortunately, it is impossible to create a high local concentration of a therapeutic enzyme, especially for strictly localized damage caused by thrombi or tumors or for the delivery of the enzyme to a specific organ, like the liver. Therapeutic enzymes have no marked affinity for the damage site, that is, no capability for "directed transport." In order to create a high local concentration of a given enzyme, it is necessary to raise its level throughout the body, which is extremely undesirable because of the already mentioned side effects on the foreign protein, if not simply because of an inefficient use of expensive medicinal preparations. Attempts to solve at least some of the enumerated problems were initiated long ago, basically by means of modifying the methods of using enzymatic preparations, although it is apparent that the best results can be obtained only in a comprehensive solution of the problem.

Approaches developed in the sphere of the earlier mentioned industrial enzymology can serve as the basis for a comprehensive solution. Actually, the principles of creating stable, highly effective biotechnological catalysts in industry and medicine need not be different--indeed, we are talking about unidirectional actions on compounds of the same nature. One need only select the methods of action on an enzymatic preparation that will correspond to its medical purpose.

Thus, many approaches to deriving modified or, as we are given to call them, immobilized enzymes formulated in related fields can be successfully transferred to traditional medical objectives. We will discuss possible methods of immobilizing enzymes somewhat later, but here we will mention this. The development of methods of deriving immobilized enzymes with medical applications already has its own history, since the first such work was done at the end of the sixties. We are not speaking of the preparations merely as something designed to be introduced into the body in the form of drops, tablets, or injections. No, the unique biological properties of enzymes enable us to address the exceptionally wide sphere of possible implementation of immobilized enzymes in medicine. We will discuss all that in the following sections.

# APPENDIX

Application	Enzyme	Action	Method of Immobilization
For substitution therapy in the treatment of disorders of the digestive organs (implantation, parenterally)	Pepsin, chymotrypsin, trypsin, amylase lipase or their mixtures	Local	Enclosed in microcapsules, polymer gels and particles
For treatment of tumors (implantation, intravenously, parenterally, or extracorporally)	Asparaginase, arginase, nuclease, desoxyribonuclease	Local and/or systemic	Enclosed in microcapsules, liposomes, shadow cells, gel particles, stabilized with soluble polymers
For treatment of inherited lysosomal deficiency (intravenously)	Glucosidase, glucuronidase, galactosidase	Local	Enclosed in liposomes (with additional stabilization with intermolecular cross-linking or soluble polymers)
For thrombolytic therapy (intravenously)	Plasmin, urokinase, streptokinase, tissue activator of plasminogen	Local and/or systemic	Stabilized with soluble carriers, enclosed in biodegradable microparticles or in shadow cells
Against bacteria and viruses; against allergies (intramuscularly or intravenously)	Penicillinase, lysozyme, nuclease	Systemic	Attached to soluble carriers, enclosed in microcapsules, shadow cells, liposomes
To act on pathological tissue; antiinflammatory enzymes (locally)	Trypsin, chymotrypsin, collagenase, papain, ribonuclease,	Local	Attached to materials for dressing, debridement, enclosed in

desoxyribonuclease,  
peptidase,  
lysozyme

microcapsules  
and polymer-gel  
granules

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UDC 577.112.083+577.152.113

ISOLATION OF CHOLESTEROL OXIDASE FROM NON-PIGMENTED STRAIN OF STREPTOMYCES LAVENDULAE

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 22, No 4, Jul-Aug 86 (manuscript received 24 Mar 84) pp 451-454

[Article by A.A. Imshenetskiy, G.A. Kazakov, A.P. Sukhikh, L.Ye. Nikitin, T.S. Nazarova, L.N. Muntyan and G.A. Shirshova, Institute of Microbiology, USSR Academy of Sciences, Moscow]

[Abstract] Cholesterol-oxidase from Str. lavendulae BKM A-840, grown under semi-industrial conditions, was studied. Cholesterol-oxidase was isolated from mycelium by extraction by a 0.05 M sodium-phosphate buffer at pH 7.0 containing 0.1 percent Tween-80, at room temperature for 30 minutes. Extraction was performed with a surfactant, ultra-filtration, gel-filtration and ion-exchange chromatography on DEAE cellulose. Optimum conditions of obtaining a high enzyme yield with the lowest possible protein level in the extracts were discussed. The end product of extraction had specific activity of 73 units/mg of protein. The enzyme retained 36 percent of the initial activity after 20-fold purification. Cholesterol oxidase from Str. lavendulae has been shown to reduce the cholesterol level in blood of rabbits with experimentally-induced arteriosclerosis. Figures 2; references 20: 5 Russian, 15 Western.

2791/9835

CSO: 1840/550

UDC 537.84:532.529+537.621.4:577.3.04

MAGNETIC BLOOD CELLS

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 1, Jan 87  
(manuscript received 26 May 86) pp 127-133

[Article by E.Ya. Blum, R.Ya. Ozols and Yu.A. Plyavinsh, Institute of Physics, Latvian SSR Academy of Sciences]

[Abstract] A brief review is presented of the magnetic properties of erythrocytes and lymphocytes, the diamagnetic characteristics of which were demonstrated for the first time in 1845. These properties have been used in the separation and classification of these cells, as well as in evaluation of the physiologic status. For example, erythrocytes with oxy- or carboxynemoglobin are more diamagnetic than cells with deoxy- or methemoglobin. Similarly, the diamagnetism of normal lymphocytes is greater than that of leukemic cells, and the diamagnetism of both is higher than that of dead leukemic cells. The magnetic properties of the erythrocytes and lymphocytes may also be altered by exposing them to nano-sized particles of iron or magnetite, without altering the morphological features of the cells. Figures 6; references 27: 16 Russian, 11 Western.

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CSO: 1840/605

UDC 577.3

TRIBOLUMINESCENCE OF ELECTROLYTES AND ORGANIC COMPONENTS OF HUMAN SERUM

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 2, Feb 87  
(manuscript received 14 May 86) pp 66-69

[Article by V.A. Baraboy and V.E. Orel, Kiev Scientific Research Institute of X-Ray Radiology and Oncology]

[Abstract] Studies were conducted on the triboluminescent properties of several different components of human serum, using a specially-designed

instrument for this type of investigation (TRA-1) (made at the authors' Institute). In the study, a 0.05 ml sample was applied to chromatographic paper, dried, and subjected to a rotating grinding motion by a plastic cylinder at 978 GPa, 44.5% rel. humidity, and 20°C. Triboluminescence intensities were measured for the electrolytes, serum albumin, amino acids, glucose, cholesterol, glycerol and fatty acids. Triboluminescence of the electrolytes increase in direct proportion to the increase in concentration, while the low level of triboluminescence of the amino acids was virtually unaffected by the concentration factor. Serum albumin displayed marked luminescence in the 0.1-5% concentration range proportional to the concentration. Glucose displayed a greater degree of triboluminescence, while the most intense triboluminescence was shown by the lipid components, especially cholesterol. The latter phenomenon was attributed to the significant role of free radicals in the process formed as a result of lipid peroxidation. Figures 1; references 5: 2 Russian, 3 Western.

12172/9835

CSO: 1840/629

UDC 578.821.51:578.5:577.212.3:575.222.75

VACCINIA VIRUS AS VECTOR FOR GENETICALLY ENGINEERED VACCINES AND ROLE OF VIRAL PROTEIN FUNCTIONS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 4, Jul-Aug 86 pp 509-512

[Editorial commentary]

[Abstract] The discovery in 1982 that the vaccinia virus genome contains a long sequence of approximately 30,000 bases that is not required for its reproduction has opened new vistas in genetic engineering of viruses. This region has been replaced by genes from other viruses in a number of experiments, resulting in the production of both vaccinia and foreign viral proteins in cells. This approach was found successful in the production of the HBsAg of viral hepatitis B, hemagglutinins of influenza viruses, gD protein of herpes simplex virus, and so forth. This technique makes it possible to study selected proteins of other viruses in their pure form, uncontaminated by other proteins from the virus that yielded the replacement gene. Currently, such recombinant genomes are undergoing extensive animal evaluation to assess their safety for the production of viral vaccines suitable for human use.

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CSO: 1840/609

UDC 577.152.41:576.851.49

PREPARATION OF SPHEROPLASTS FROM CITROBACTER FREUNDII BACTERIA CELLS

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 22, No 4, Jul-Aug 86 (manuscript received 28 May 84) pp 492-499

[Article by I.V. Tsyachnaya, K.I. Voyvodov, V.A. Fehina, A.M. Ryabokon, V.I. Yakovleva and I.V. Berezin, Moscow State University]

[Abstract] A simple, rapid and readily-reproducible method of determining viability of bacteria spheroplasts is described and discussed. The effect of

different conditions of lysis of *Citrobacter freundii* cell wall by a lysozyme was studied during change of parameters such as age of culture, pH, temperature and concentration of EDTA, sucrose and lysozyme. Lysis of *C. freundii* cell wall proceeded much more quickly at 37 degrees than at 30 degrees and differences in lysozyme concentration had much less effect than a change of reaction temperature. For production of spheroplasts with the highest possible degree of integrity, lysis must be conducted in a hypertonic medium with 1.0 M sucrose. At lesser concentrations of sucrose or in its absence, the cytoplasmic membrane as well as the cell wall is destroyed. Information about the course of lysis and the nature of the forming particles, especially the degree of integrity of the spheroplasts, may be obtained by studying turbidity spectra of cell suspensions at different stages of processing by lysozyme. Figures 4; references 17: 8 Russian, 9 Western.

2791/9835

CSO: 1840/550

UDC 582.232.5:581.133.11

COMPARATIVE STUDY OF CONDITIONS OF PHOTOREDUCTION OF ACETYLENE BY ANABAENA VARIABILIS AND RHODOPSEUDOMONAS SPHAEROIDES

Moscov PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 22, No 4, Jul-Aug 86 (manuscript received 7 Jun 84) pp 500-506

[Article by Ye.N. Peletskaya, O.G. Polesskaya and A.A. Krasnovskiy, Moscow State University; Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences]

[Abstract] The formation of molecular hydrogen by nitrogen-fixing phototrophs, which is also catalyzed by a nitrogenase enzyme complex is important because it suggested that the title microorganisms could be used in vivo and in acellular systems for bioengineering production of gaseous hydrogen and fixation of molecular hydrogen. Therefore, study of optical conditions of detecting nitrogenous activity and determining the relative resistance of this activity to external factors was undertaken. Description is given of a comparative study of nitrogenase activity in *Anabaena variabilis* and *Rhodopseudomonas sphaeroides* with regard to the effect of heating and factors affecting membrane integrity. Optimum conditions of manifestation of nitrogenase activity, including the effect of age of the culture, illumination, temperature, pH of the reaction medium and composition of the gaseous phase, were studied. Maximum rate of acetylene reduction occurred at 30 degrees for *Anabaena variabilis* and at 35 degrees for *Rhodopseudomonas sphaeroides*. Nitrogenase activity persisted upon heating up to 50-55 degrees in cyanobacteria (*A. variabilis*) and up to 55-60 degrees in purple bacteria (*R. sphaeroides*) cells. Treatment by Triton X-100 at concentrations up to 3 percent did not change acetylene reduction by the cyanobacteria studied but suppressed it in purple bacteria and increased the thermolability of this



process in purple bacteria. Repeated freezing to -196 degrees and thawing completely suppressed nitrogenase activity in cyanobacteria and suppressed acetylene reduction in purple bacteria, to a lesser extent. Purple bacteria were more resistant to ultrasound. Figures 7; references 16: 5 Russian; 11 Western.

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UDC 579.[842.11 + 862.1]

SELECTION OF ESCHERICHIA COLI AND PSEUDOMONAS PUTIDA CULTURES WITH ELEVATED STABILITY TOWARDS IMMOBILIZATION PROCESS IN POLYACRYLAMIDE GEL

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 1, Jan-Feb 86 (manuscript received 20 Aug 84) pp 100-104

[Article by N.G. Starostina, K.A. Lusta and B.A. Fikhte, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino]

[Abstract] The use of immobilized microorganism cells as biocatalysts in complex multistage processes such as transformation of steroids, sugars, enzymes and antibiotics necessitates the immobilized cell to function as a polyenzymic system. One of the problems plaguing this system is that during the immobilization process the carrier may deactivate these cells. A new approach to this problem is reported based on selection of cell clones with increased resistance to such a deactivating process. Such clones were indeed found: *E. coli* (A4, A70 and G60) and *P. Putida* (A70 and G30). The latter were more sensitive to these agents than the former cells. The frequency of the appearance of resistant cells correlated with the frequency of bacterial mutations. In general, the decreased index of the viability of bacterial populations during immobilization on polyacrylamide gel depended on their growth phase. But in these isolated cells, the higher stability was independent of the growth phase. Figures 1; references 15: 8 Russian (1 by Western authors), 7 Western.

7813/9835  
CSO: 1840/562

UDC 616.98:578.32-036.2:313(574)

INFLUENZA MORBIDITY IN KAZAKH SSR IN 1977-1984

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 4, Jul-Aug 86  
(manuscript received 2 Jul 85) pp 426-430

[Article by A.T. Ismagulov, M.Kh. Sayatov, S.A. Niyetkaliyeva, V.Kh. Urazov and K.G. Ansariyeva, Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases, Kazakh SSR Ministry of Health; Institute of Microbiology and Virology, Kazakh SSR Academy of Sciences, Alma-Ata]

[Abstract] An analysis was conducted on the influenza statistics for Kazakhstan for the period 1977-1984. In that time frame, 6 epidemics were revealed, two of which were due to influenza B (1981 and 1984), and the remaining 4 to influenza A (H3N2) and A (H1N1). The influenza A outbreaks were characterized by gradual attenuation of the morbidity and a decrease in the incidence of virus isolation. Influenza B outbreaks, however, were characterized by a more serious course and tended to affect the pediatric population. Figures 1; references 7 (Russian).

12172/9835  
CSO: 1840/609

UDC 576.893.192.6.095.18:283.926

IN VIVO AND IN VITRO STUDIES ON SUSCEPTIBILITY OF PATIENT-IMPORTED  
PLASMODIUM FALCIPARUM TO ANTIMALARIAL AGENTS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI  
in Russian No 6, Nov-Dec 86 (manuscript received 10 Apr 86) pp 42-45

[Article by Z.I. Glazunova, Yu.P. Gorbunova, M.I. Alekseyeva, N.V. Astafyeva and K.D. Imamkuliyeu, Chair of Tropical Diseases, Central Order of Lenin Institute for Advanced Training of Physicians, USSR Ministry of Health, Moscow]

[Abstract] In vivo and in vitro studies were conducted on Plasmodium falciparum strains of 23 patients who developed clinical malaria after returning to the

USSR from various African countries. The in vivo method involved the WHO 28-day test, and the in vitro the Rieckmann macro- and micro-tests. Among the 18 *P. falciparum* isolates, two were identified as resistant to chloroquin, corresponding to R-1 resistance on the WHO scale. One isolate (from Mozambique) also displayed resistance to the sulfadoxine + pyrimethamine combination in vivo, while the other isolate (from Angola) was also resistant to mefloquine in vitro. Comparative studies on six isolates confirmed the congruence of results obtained with the the in vitro and the in vivo tests in terms of chloroquin resistance and susceptibility. Figures 1; references 18: 9 Russian, 9 Western.

12172/9835  
CSO: 1840/601

UDC 576.895.771.095.18:615.285.7

INSECTICIDAL SUSCEPTIBILITY AND IRRITABILITY OF SOVIET ANOPHELES MOSQUITOES.  
PART 1. ANOPHELES PULCHERRIMUS THEOBALD

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 6,  
Nov-Dec 86 (manuscript received 9 Oct 85) pp 52-55

[Article by N.I. Bondareva, M.M. Artemyev and G.V. Grachev, Institute of Medical Parasitology and Tropical Medicine imeni Ye.I. Martsinovskiy, USSR Ministry of Health, Moscow]

[Abstract] Monitoring studies were conducted on the susceptibility of *Anopheles pulcherrimus* mosquitoes in Tajikistan, Uzbekistan, Turkmenistan and Kazakhstan to selected insecticides, and the irritating effects that these agents exerted on the mosquitoes. The data were collected for the years 1961-1984. In the selected areas of interest in Central Asia, resistance to DDT ranged from 5 to 24%. The figures have remained basically constant, despite periodic and local fluctuations. The mosquitoes were found to be susceptible to malathion, fenitotrion, and propoxur. Studies on irritability of the mosquitoes demonstrated a genetic basis. DDT was ascertained to be the most frequent irritant, causing the mosquitoes to take flight and avoid the insecticide. For that reason the use of DDT is not recommended at the present time in Central Asia. Malathion at the present time does not irritate the mosquitoes and remains an effective insecticide, although an increase in irritability among the mosquitoes was noted in Southern Tajikistan in 1985. Fenitotrion may in the future replace malathion as the insecticide of choice in view of its non-irritative characteristics. Propoxur, however, has been found to be highly irritant and is therefore excluded from consideration in *A. pulcherrimus* control. Tables 3; references 12: 11 Russian, 1 Western.

12172/9835  
CSO: 1840/601

SUSCEPTIBILITY OF DIFFERENT MOSQUITO GENERA AND LARVAL STAGES TO BACTERIAL PREPARATIONS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 6, Nov-Dec 86 (manuscript received 21 May 85) pp 55-58

[Article by L.A. Ganushkina and A.A. Voytsik, Institute of Medical Parasitology and Tropical Medicine imeni Ye.I. Martsinovskiy, USSR Ministry of Health, Moscow]

[Abstract] Standard bacterial preparations from *Bacillus thuringiensis* var. *israelensis*, serotype 14, and *B. sphaericus* 2362 were tested for their killing power on I-IV stage larvae of the following mosquitoes: *Anopheles sacharovi*, *An. stephensi*, *An. atroparvus*, *Aedes aegypti*, and *Culex molestus*. In general, the susceptibility of the larvae decreased 1.5- to 4-fold as they aged from one stage to another. *An. sacharovi* showed the greatest resistance, and *Cx. molestus* the least. The genus *Aedes* was found to be more susceptible to the bacterial preparations than the *Anopheles* mosquitoes. References 18: 6 Russian, 12 Western.

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CSO: 1840/601

KOUTANGO VIRUS (FLAVIVIRUS TOGAVIRIDAE) IN SOMALIA

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 3, May-Jun 86 (manuscript received 13 Feb 85) pp 65-68

[Article by A.M. Butenko, I.V. Semashko, T.M. Skvortsova, V.L. Gromashevskiy, N.G. Kondrashina, D.K. Lvov and V.F. Popov, Institute of Poliomyelitis and Viral Encephalitis, USSR Academy of Medical Sciences; Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences; Central Scientific Research Institute of Sanitation Education, USSR Ministry of Health, Moscow]

[Abstract] Analysis of material collected in Somalia in 1974 yielded several viruses, as previously reported. In the present paper, another arbovirus was isolated (Strain 632) from the brain of gerbils and identified as Koutango virus of the flavivirus family. Somalia is the third African country, in addition to Senegal and Central African Republic, where this virus has been discovered and associated ecologically with rodents. References 7: 3 Russian, 4 Western (1 by Russian authors).

7813/9835  
CSO: 1840/597

TICK-BORNE ENCEPHALITIS (TBE) VIRUS CARRIER INCIDENCE AMONG ADULT IXODID TICKS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 29 Mar 85) pp 319-321

[Article by E.I. Korenberg, G.G. Bannova, Yu.V. Kovalevskiy and  
A.S. Karavanov, Scientific Research Institute of Epidemiology and  
Microbiology imeni N.F. Gamaleya and SRI of Poliomyelitis and Viral  
Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] An analysis was conducted on the carrier rate for the TBE virus among the ixodid ticks (*Ixodes persulcatus*) in a previously described region [Kovalevskiy, Yu.V., et al., Zool. Zhurn., No 1: 31-43, 1979]. Evaluation of the tissue culture results demonstrated that 3.6% of the ticks were carriers, with a population density of infected ticks equal to 0.8/100 m<sup>2</sup> in the region. By comparison, *D. silvarum* ticks were found to be free of the TBE virus. The average dose load per *I. persulcatus* was estimated at ca. 4.17 log TCD<sub>50</sub>/ml units. References 15: 1 Czech, 13 Russian, 1 Western.

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CSO: 1840/608



UDC 575.24

ANALYSIS OF COMPLEMENTARY INTERRELATIONSHIPS OF MUTATIONS INDUCED BY  
SYNTHETIC POLYNUCLEOTIDES IN DROSOPHILA

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE,  
KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 2, Feb 87  
(manuscript received 15 Apr 86) pp 63-66

[Article by Yu.N. Aleksandrov, Institute of Molecular Biology and Genetics,  
Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] An analysis was conducted on the interrelationship of complementary mutations in drosophila induced by synthetic polynucleotides, relying on the construction of matrices of allelic relationships of lethal mutations. Crossing studies within each group of lethal mutations induced by a given mutations, as well as between groups led to complementation maps that favored identification of all the possible relationships among the mutations. For the groups of lethal mutations, induced by poly(I), poly(U) and poly(dT), complicated allelic relationships were not established. However, in the case of mutations induced by poly(A), poly(dA), and poly(A,C) multiple allelic relationships were found to prevail. Mutations induced by poly(A,C) appeared to arise at two loci, with two of the four chromosomes carrying a lethal mutation appearing as dilethals. Lethal mutations induced by poly(A) affect five loci, with nine of the 12 'lethal' chromosomes carrying two mutations. Finally, the matrix analysis demonstrated that poly(dA) was capable of inducing five lethal mutations at five loci: 5 of the 9 'lethal' chromosomes carried 2 mutations, and 3 'lethal' chromosomes sustained 3 mutations each. Figures 1; references 11 (Russian).

12172/9835  
CSO: 1840/629

# TRANSPOSITION OF MOBILE DISPERSED GENES IN MUTATION SYSTEM INDUCED BY DNA ADMINISTRATION IN DROSOPHILA

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 2, Feb 87  
(manuscript received 18 Aug 86) pp 80-84

[Article by T.V. Shandala, V.A. Mogila, T.I. Gerasimova and S.M. Gershenzon, academician, UkSSR Academy of Sciences, Institute of Plant Physiology, Ukrainian SSR Academy of Sciences, Kiev; Institute of General Genetics, USSR Academy of Sciences, Moscow]

[Abstract] Genetic studies on drosophila demonstrated that injection of exogenous DNA was capable of inducing transposition of mobile dispersed genetic elements. Injection of 0.003-0.004  $\mu$ g of polyhedrosis virus DNA into hemocells of male drosophila resulted in the identification and detailed analysis of two mutations: beaded wing (Bd; dominant, recessive lethal effect, III: 87.8; 12 appearances with a frequency of  $4 \times 10^{-4}$ ), and thickened vein (thi; recessive, II: 71.5; 7 appearances with a frequency of  $2 \times 10^{-4}$ ). The absence of the P element in the drosophila lines under study demonstrated that the instability in the mutation system induced by the injection of the DNA was independent of the P-M system of hybrid dysgenesis. Appearance of a number of other mutations in the progeny of Bd and thi flies was characterized by a high degree of locus specificity. The repeated appearance of mutations affecting the identical genes--y, cv, r, dlv, dp, Bd--with a frequency  $10^{-4}$  to  $10^{-5}$  appeared simultaneously with reversions of the initial mutations, as well as with retention of the initial mutations. The high frequency and multimutational nature of this phenomenon indicated that they were due to transposition of mobile elements. References 15: 9 Russian, 6 Western.

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CSO: 1840/629

# BACTERIAL GENOME CONSTRUCTION: NEW ADVANCES IN GENETIC ENGINEERING

Moscow GENETIKA in Russian Vol 22, No 6, Jun 86 (manuscript received 5 Sep 85) pp 901-913

[Article by V.V. Sukhodolets, All-Union Scientific Research Institute of Genetics and Breeding of Industrial Microorganisms, Moscow]

[Abstract] A literature survey is presented of the current advances in the construction of a bacterial genome, based primarily on the E. coli chromosome. The current hypotheses emphasize the importance of genetic drift,

consisting of insertion of exogenous genes and rare inversions in the *oriC* and/or *terC* regions of the chromosome. Such mechanisms lead to insertion of genes offering evolutionary advantages and favoring adaptability to various ecological niches, with the inversions providing for a balance in the distribution of such genes along the length of the chromosome. The *E. coli* K-12 genome has been classified into 10 categories on the basis of the reactions carried out by the appropriate enzymes. Essential and nonessential or extraneous enzymes and reactions have been identified. The fundamental approach assumes that a functional, but basic, bacterial genome may be constructed that is devoid of the extraneous genes, such as are responsible for adaptation to new ecological factors. Figures 2; references 69: 10 Russian, 59 Western.

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UDC 577:633.16

#### CHARACTERIZATION OF CLONED REPETITIVE DNA SEQUENCES OF BARLEY GENOME

MOScow GENETIKA in Russian Vol 22, No 6, Jun 86  
(manuscript received 29 Apr 85; in final form 9 Oct 85) pp 920-928

[Article by Ye.V. Ananyev, S.S. Bochkanov, M.V. Ryzhik, N.V. Sonina, A.I. Chernyshev, N.I. Shchipkova and Ye.Yu. Yakovleva, Institute of General Genetics imeni N.I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] Standard recombinant techniques were employed using plasmid pBR325 to clone repetitive DNA sequences of barley (*Hordeum vulgare*) genome. *EcoRI*, *BamHI*, *HindIII* and *EcoRV* yielded different fractions ranging in size from 2.3 to 10 kb, confirming the presence of a significant number of repetitions. Cloning *EcoRI* fragments 2 to 14 kb in size demonstrated that more than 95% of the DNA insertions are represented by repetitions, differing in complexity and copy number. Certain of the DNA sequences represented families accounting for at least 1% of the barley genome. Blotting hybridization showed that most of the clones contained DNA sequences representative of repetitive segments that are dispersed among the barley chromosomes. Figures 5; references 24: 2 Russian, 22 Western.

12172/9835  
CSO: 1840/642

STATISTICAL ANALYSIS OF ABNORMAL HUMAN  $\alpha$ - AND  $\beta$ -GLOBINS

Moscow GENETIKA in Russian Vol 22, No 6, Jun 86 (manuscript received 17 Oct 85) pp 1040-1046

[Article by Yu.Ye. Dubrova, Institute of General Genetics imeni N.I. Vavilov, USSR Academy of Sciences, Moscow]

[Abstract] A statistical analysis was conducted on published data on the primary structure of 123 abnormal  $\alpha$ -globin chains and 211  $\beta$ -globin chains. The analysis revealed that in humans the average number of point mutations in the  $\beta$ -chain was 1.66-fold higher than in the  $\alpha$ -chain. Evaluation of the data, in terms of conformational stability, variability and effects of mutations on functional characteristics of hemoglobin, suggested that 40% of the mutations in  $\alpha$ -globins are eliminated in the antenatal period. The difference in the apparent rate of mutation frequency in the  $\alpha$ - and  $\beta$ -globins is due to the fact that the former is under the control of two nonallelic genes, while the latter is under the control of one gene. The decrease in the frequency of mutation at the  $\alpha$ -locus may be attributed to gene conversion and crossover. Figures 4; references 19: 5 Russian, 14 Western.

12172/9835  
CSO: 1840/642

UDC 631.52+632.9:632.4]:633.11

## GENETIC CONTROL OF RESISTANCE TO BROWN RUST IN COMMON SPRING WHEAT VARIETIES

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 31, No 3, Mar 87  
(manuscript received 26 Jun 86) pp 264-267

[Article by N.A. Dorozhkin, academician, BSSR Academy of Sciences, A.N. Palilova and Ye.A. Voluyevich, Institute of Genetics and Cytology, BSSR Academy of Sciences]

[Abstract] Brown rust is a widely spread wheat disease in the USSR which can be controlled by selection of resistant varieties through intraspecies hybridization. Genetic control of this resistance to the 77th race of brown rust was studied on the following varieties of common spring wheat crossed with Mironovskaya 808 brand: Lee, Crim, Gabo, RR-21, HB 117-107, Jaral 66, Red River 68, Kenya Plume, Belorusskaya 12 and Leningradska in early and late stages of ontogenesis. Experiments were performed in greenhouses, the plants being grown in pots. Analysis of F<sub>2</sub> and F<sub>3</sub> generations showed that the character of the dominance and the number and type of genetic interactions controlling resistance depended on the genotype of the resistance donor, phase of ontogenesis of the hybrid plants and direction of crossings. The most valuable varieties for such crossings are polygenic ones

carrying several resistance factors, especially those manifested at the late stages of ontogenesis: Red River, Kenya Plume, Jaral 66, Lee, Crim and Gabo. The last three carry Lr 23 gene which is widely used in selection programs and therefore they are not recommended in this program because they could possibly result in massive damage to derived varieties. References 8: 5 Russian, 3 Western.

7813/9835

CSO: 1840/604



DEVELOPMENT OF REGIONS WITH HARSH CLIMATE

Moscow ADVANCES OF SCIENCE AND TECHNOLOGY No 7, Mar 5 87, pages not specified

[Article by Academician Vlaiil Kazanacheyev, director of the Institute of Clinical and Experimental Medicine, Siberian Department, USSR Academy of Medical Sciences]

[Text] Some 20 or 30 years ago no one wondered why the workforce turnover at Siberian and extreme northern construction sites amounted up to 80 percent a year. It was put down to a harsh climate and lack of conveniences. Now, working and living conditions have improved drastically and labor turnover has dropped, but it still remains high.

Many workers still do not want to stay on. Why?

The studies of human adaptation to harsh living conditions revealed that different people get adjusted to a new lifestyle in different ways. One category, which we usually call "sprinters", get adjusted to new conditions easily enough, and they can work hard for a while, but not for long. Workers at northern construction sites can work efficiently enough for no longer than two or three years. Then their productivity drops and their physical condition deteriorates. As a result, the "sprinter" will resign and go back to his native parts.

The other category, or "stayers," take a long time to get adjusted to new conditions (not only to a harsh climate but to any change in their habitual lifestyle). The first year is the hardest for them, as they are often sick for no reason (or that is what they think) and easily tired. Scared off by all those factors, many of them head out very soon. Yet those who stay on feel much better the next year, and in the third or fourth year they get adjusted very well and settle down at the new place. Incidentally, 96 to 98 percent of the native population of the extreme North of the USSR--Eskimos, Chukchi, Gonosans and other ethnic groups--consist of "stayers."

The data obtained made it possible to develop the first practical recommendations on how to form work teams to be sent to new regions. New settlers often have to start from scratch in the taiga or to a desert, so their first team must be made of "sprinters" capable of carrying out the task because they are easily adjustable. They must be replaced by "stayers" who are expected to

stay on and work at a new plant or develop a new oil-field.

It is quite possible to choose which of the "pioneers" are "sprinters" and which of them are "stayers". The simplest test is to determine the composition of the candidate's muscles: the sprinter's muscles consist mostly of red fibers capable of a short but intense effort, and the long-distance runners' are mostly made of white fibers that can endure strain for a long time. Suppose you ask the candidate to press the dynamometer as hard as he can, then divide the obtained figure by two and count the time during which he can maintain this 50-percent load. The results will reveal the category to which this particular individual belongs. If he can maintain the pressure for 10 to 15 minutes, he is a pure "sprinter" type, if he can hold on for one, two or more minutes, he is a typical "stayer." Any intermediate figure shows the so-called mixed type with prevailing features of a "sprinter" or "stayer."

Naturally, the dynamometer test cannot give you a 100 percent guarantee. More reliable tests are based on a profound analysis of psycho-physiological differences between the "sprinter" and "stayer" types. For instance they neutralize alien toxins penetrating into their body in different ways. They also differ in blood composition, metabolism and immunity. They even have a different constitution and motor characteristics (type of movement). All that makes it possible to use complex tests--biochemical blood, etc.--to determine the type of man with an adequate degree of precision.

You may wonder why we have discovered the existence of the two types only recently. The matter is that in the past the zones with a harsh climate were mostly explored by short-term expeditions, so medicine was concerned mostly with their SURVIVAL. It was not so long ago that it was decided to develop those regions and build permanent towns and townships there. That has made medical researchers focus on ADAPTATION of man to unfavorable conditions.

The adaptation problem studied by our Institute is very important indeed not only because it arises in the process of developing the Siberian taiga and tundra. It is characteristic of any attempt to populate a zone with a harsh climate. In the Soviet Union it also arises in Central Asian deserts. As for other parts of the world, it is typical of Canada's north-eastern provinces, Brazil's selva and even British and Norwegian oil-fields in the North Sea. In the future, humanity will have to develop a whole continent, the Antarctica, and in a more remote future it will populate near space as well. That is why it is so essential today to learn how to choose people for work in harsh conditions.

/9835

CSO: 1840/663-E

UDC 616.98:578.825.12]-092:[616-092:612.017.1-064]-021.5-003.6

CYTOMEGALOVIRUS INFECTION AND AIDS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 4, Jul-Aug 86  
(manuscript received 30 Aug 85) pp 389-393

[Article by N.A. Farber and V.M. Zhdanov, Institute of Virology  
imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] A short review is presented of the clinical and serological similarities and dissimilarities in cytomegalovirus (CMV) infection and AIDS. Basically, it has been observed that antibodies against CMV are encountered in 94-100% of AIDS patients, leading to the suggestion that such antibodies may be regarded as 'surrogate markers' for AIDS. In addition, the modes of transmission of both entities appears to be identical, with immunosuppression a signal characteristic of both diseases. Furthermore, the CMV genome has been detected in Kaposi's sarcoma cells of AIDS patients, as well as in their leukocytes. These findings and observations underscore the need for acute clinical and research acumen in studies on the prevention, epidemiology, and clinical management of CMV infections and AIDS. References 74: 11 Russian, 63 Western.

12172/9835  
CSO: 1840/609

REACTOGENICITY, GENETIC STABILITY AND EFFICACY FOR CHILDREN OF LIVE  
RECOMBINANT INFLUENZA VACCINE CONSTRUCTED FROM COLD-ADAPTED A/LENINGRAD/134/47/57  
VIRUS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 4, Jul-Aug 86  
(manuscript received 14 Nov 85) pp 411-414

[Article by G.I. Aleksandrova, T.Ye. Medvedeva, F.I. Polezhayev,  
L.M. Garmashova, G.N. Budilovskiy, T.A. Koval, Yu.Z. Gendon and  
Yu.R. Romanova, Scientific Research Institute of Experimental Medicine,  
USSR Academy of Medical Sciences, Leningrad; Kaliningrad Oblast Department  
of Health; Scientific Research Institute of Viral Preparations, USSR  
Ministry of Health, Moscow]

[Abstract] The cold-adapted influenza virus A/Leningrad/134/47/57 (H2N2), carrying 5 mutations in genes 1, 2, 5, 7, and 8, was used for the construction of recombinant viruses 47/25/1 (H1N1) and 47/7/2 (H3N2) from virulent viruses A/Brazil/11/78 (H1N1) and A/Bangkok/1/79 (H3N2). Clinical trials consisted of immunization of 30,000 pupils and pre-schoolers in 1982, with protective data collected over the subsequent 6 months as well as during the 1983 epidemic. The 47/25/1 (H1N1) and 47/7/2 (H3N2) vaccines induced a transient febrile response in less than 1% of the immunized contingent, with no manifestations reminiscent of acute upper respiratory infections. The vaccines were found to be highly immunogenic, with antibody formation in 90.5% of those immunized with 47/7/2 (H3N2) and in 79.7% of those immunized with 47/25/1 (H1N1). The vaccines were protective against influenza infections with antigenically similar influenza A viruses with an index of effectiveness of 2, and antigenically stable. References 5: 2 Russian, 3 Western.

12172/9835  
CSO: 1840/609

UDC 578.832.1:578.74]:578.224

ENHANCEMENT OF IMMUNOGENECITY OF INFLUENZA VIRUS SURFACE PROTEINS BY  
THEIR INCLUSION IN LIPOSOMES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 2, Mar-Apr 86  
(manuscript received 11 Mar 85) pp 162-167

[Article by I.G. Kharitononkov, N.G. Yaroslavtseva, Ye.I. Isayeva,  
Z.I. Rovnova, V.B. Grigoryev, Yu.V. Kravtsov and P.N. Kosyakov, Institute  
of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences,  
Moscow]

[Abstract] An alternative method is described for production of highly-immunogenic preparations based on individual proteins of influenza virus: inclusion of such proteins in synthetically formed liposomes was the basis

for this new method as the immunoadjuvant properties of the liposomes are well known. On the basis of this work and some literature data, a procedure was developed for production of immunogenic preparations from influenza virus surface glycoproteins containing no internal ballast proteins. This procedure consists of: a) solubilization of the mixture of virion surface proteins (hemagglutinin and neuraminidase) by treatment with octylglucoside; b) ultracentrifugation to remove subviral particles containing internal proteins of viral portion; c) addition of a mixture of exogenous lipids to the incubation mixture containing detergent; and d) removal of detergent by dialysis and formation of proteoliposomes. Surface glycoproteins increased their immunogenicity 10-12 fold after inclusion in liposomes. Monolamellar liposomes could be viewed as an analog of Freund's adjuvant. Possible use of virosomes as subunit influenza virus vaccine was speculated on. Figures 2; references 25: 5 Russian, 20 Western (1 by Russian authors).

7813/9835  
CSO: 1840/607

UDC 616.98:578.833.2]-078.73

#### INDIRECT IMMUNOENZYMATIC METHOD FOR LABORATORY DIAGNOSIS OF LASSA AND EBOLA HEMORRHAGIC FEVERS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 2, Mar-Apr 86  
(manuscript received 26 Dec 84) pp 186-190

[Article by A.P. Ivanov, Ye.A. Tkachenko, G. van der Groen, A.M. Butenko and O.K. Konstantinov, Institute of Poliomyelitis and Viral Encephalitis, USSR Academy of Medical Sciences, Moscow; Prince Leopold Institute of Tropical Medicine, Antwerp, Belgium]

[Abstract] Lassa and Ebola hemorrhagic fevers continue to present a problem in the USSR because of the lasting possibility of importing these diseases from Africa. A detailed description of key steps in setting up indirect solid phase immunoenzymatic assay (SPIEA) for laboratory diagnosis of these diseases and application of this method in evaluation of materials supplied from African countries is given. The assay was shown to be highly sensitive and specific. Nonspecific reactions could be easily differentiated with normal antigens. It is a simple test, objective and rapid; in a period of 6-24 hrs hundreds of samples could be analyzed. It could be used directly on crude organ extracts of infected animals, sidestepping the necessity to enrich the samples on cell cultures. It is applicable to large scale diagnostic and epidemiological screening studies. References 4:  
1 Russian, 3 Western (1 by Russian authors).

7813/9835  
CSO: 1840/607



PRODUCTION AND PROPERTIES OF HYBRIDOMAS PRODUCING MONOCLONAL ANTIBODIES TO  
TICK ENCEPHALITIS VIRUS

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 3, May 86  
(manuscript received 5 Aug 85) pp 199-205

[Article by A.A. Kushch, \*M. Novak, Ye.E. Melnikova, S.Ya. Gaydamovich,  
\*M. Gresikova, \*M. Sekeyova, A.C. Novokhatskiy, T.G. Mikheyeva,  
N.A. Sveshnikova, \*L. Borecky and V.M. Zhdanov, Institute of Virology  
imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, and \*Institute of  
Virology, Slovak Academy of Sciences, Bratislava]

[Abstract] Monoclonal antibodies (MA) were obtained to two strains of tick encephalitis virus (TEV): 4072 from a patient in Ural, USSR and strain Skalitsa obtained from bank vole in West Slovakia. The latter, in contrast to 4072, was non-pathogenic to mice. Over 100 hybrids were obtained producing MA to TEV: 60 of them were towards TEV 4072 and 65 towards the Skalitsa virus. Karyological analysis of these hybridomas showed extensive variability regarding the number of chromosomes within individual clones and between them. It was not possible to find any correlations between karyologic characteristics and synthesis of antibodies. When injected peritoneally these hybridomas formed ascitic tumors in 50-70% of test animals (Balb/c mice or randomly bred mice). References 19: 5 Russian, 14 Western.

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CSO: 1840/585

TWO TYPES OF MONOCLONAL ANTIBODIES TO TICK ENCEPHALITIS VIRUS

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 3, May 86  
(manuscript received 15 Jul 85) pp 206-211

[Article by S.Ya. Gaydamovich, Ye.E. Melnikova, \*M. Gresikova, \*M. Sekeyova, A.S. Novokhatskiy, A.A. Kushch, \*M. Novak, N.A. Sveshnikova, T.G. Mikheyeva, Z.N. Krasnobayeva, N.A. Lavrova, V.M. Zhdanov and \*L. Borecky, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; \*Institute of Virology, Slovak Academy of Sciences, Bratislava]

[Abstract] In a previous paper [this journal pp 199-205], production of monoclonal antibodies (MA) to two strains of tick encephalitis virus was reported. Serological characteristics of these MA are presently reported: one towards strain 4072 isolated from blood of a patient in the USSR (NEK series) and one to strain Skalitsa isolated from bank vole in Czechoslovakia (KEN series). Both of them belonged to the IgG class of immunoglobulins as determined by diffuse precipitation reaction with anti-sera IgG and IgM. Both showed high reactivity in the immunofluorescence reaction. Antibodies of NEK differed from KEN by their serological reactivities. The NEK MA reacted in the complement fixation reaction

with all tick encephalitis virus representatives with the exception of Povasson virus. MA from KEN series showed no bound complement properties and did not react with Povasson, Langat TP-21 and Skalitsa strain in the immunofluorescence reaction. Using these two groups of MA in generally available assays, 6 out of 7 viruses from the TE complex could be identified (with exception of the Pavossan virus). References 14: 4 Russian, 10 Western (1 by Russian authors).

7813/9835  
CSO: 1840/585

#### THYMUS INDEPENDENT SYNTHESIS OF ANTIBODIES TO PROWAZEKII RICKETTSIAE ANTIGEN

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 3, May 86  
(manuscript received 11 Apr 85) pp 256-260

[Article by Ye.A. Kabanova, E.D. Miskarova, G.Ye. Abrosimova and I.N. Kokorin, Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] The goal of this work was to investigate synthesis of antibodies in T-deficient animals (B-rats and B-mice) during immunization with chemical typhus vaccine (CTV) and infection with Prowazekii rickettsiae. Investigation of immune response to CTV in T-deficient animals showed high immunogenicity. Absence of T-lymphocytes in these animals showed no effect on the intensity of antibody formation after injection of CTV. Production of antibodies to thymus dependent antigen was on the level of the background readings in B-rats; TB-rats and intact animals showed a 300 to 100 fold increase respectively. Thus, it was shown that synthesis of antibodies in animals immunized with Prowazekii rickettsiae antigen has a thymus-independent character. The results have shown that thymus-independent antigens may be the soluble antigen from Prowazekii rickettsiae as well as the rickettsia itself. References 20: 4 Russian, 16 Western (1 by Russian authors).

7813/9835  
CSO: 1840/585

## EFFECTS OF SIZE OF CONTIGUOUS POLY(G) REGION IN POLY(G,A):POLY(C) ON INTERFERON INDUCTION AND ENHANCEMENT OF IMMUNITY

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 6, Nov-Dec 86  
(manuscript received 21 Oct 85) pp 697-700

[Article by L.M. Vilner, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] Chick embryo tissue culture cells were employed in assessing the significance of the extent of contiguous poly (G) segment in interferon inducers, in a system employing poly(G,A):poly(C) inducers. The highest interferon titers were obtained with poly(G):poly(C) and poly(G<sub>90</sub>A<sub>1</sub>):poly(C). Poly(G<sub>28</sub>A<sub>1</sub>):poly(C) and Poly(G<sub>17</sub>A<sub>1</sub>):poly(C) were less efficient inducers, while poly(G<sub>10</sub>A<sub>1</sub>):poly(C) was virtually without activity. Analogous results were obtained on interferon induction in BALB mice. However, in studies on BALB mice injected with the various inducers concomitantly with TBE virus vaccine and challenged with 1000 LD<sub>50</sub> dose of TBE virus 2 weeks later, variable results were obtained. Maximum survival rates were obtained in animals protected with poly(G<sub>60</sub>A<sub>1</sub>):poly(C) (84%), followed by essentially identical degrees of protection with poly(G):poly(C), poly(G<sub>90</sub>A<sub>1</sub>):poly(C), poly(G<sub>28</sub>A<sub>1</sub>):poly(C), and poly(G<sub>17</sub>A<sub>1</sub>):poly(C) (68, 76, 64, and 72%, respectively). Poly(G<sub>10</sub>A<sub>1</sub>):poly(C) administration resulted in a 44% survival rate (vs. a control rate of 40%). These findings indicate that cell receptors recognize as a lower limit a segment of ca. 17 poly(G) monomers, and possible even 10 poly(G) nucleotides, although for an optimum response poly (G<sub>90</sub>) is preferable. Figures 2; tables 1; references 7: 3 Russian, 4 Western.

12172/9835

CSO: 1840/612

UDC 616.36-002-022:578.891]-092:612.017.1.-064

## VIRAL HEPATITIS B AND IMMUNODEFICIENCY

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 6, Nov-Dec 86 p 761

[Editorial commentary]

[Abstract] Comparison of the clinical course and pathogenesis of viral hepatitis B (VHB) and AIDS has led to delineation of certain similarities and differences. Among the similarities are the facts that both entities are spread hematogenously, both tend to diminish the functional capabilities of T helpers, and both are accompanied by malignancies (VHB by hepatomas and AIDS by Kaposi's sarcoma). Among the key differences are the observations that VHB is seldom encountered in AIDS patients, generally

appearing late in the anamnesis. Furthermore, HB<sub>s</sub>Ag is seldom detected in AIDS patients, although the antibody is usually present. In addition, AIDS may occur in patients immunized against VHB, and perinatal infection in the case of VHB occurs during birth, while in the case of AIDS infection may occur in the prenatal stage. Epidemiologic studies indicate that the higher the level of immunity in a population against VHB, the better the chances of avoiding the spread of AIDS. These interrelationships between these two viral diseases demand further analysis and study both from the clinical and epidemiologic aspects.

12172/9835

CSO: 1840/612

UDC 615.281.8:547.441].015.4:578.245.2

#### INTERFERON-INDUCING AND ANTIVIRAL ACTIVITY OF MALEIC ANHYDRIDE COPOLYMERS

Moscow VOPROSY VIROSOLOGII in Russian Vol 31, No 5, Sep-Oct 86  
(manuscript received 17 Apr 85) pp 605-609

[Article by N.N. Nosik, F.I. Yershov, M.M. Kozlovskiy, I.A. Vinograd, B.A. Krentsel', L.L. Sotskaya, L.V. Osinova, G.A. Oreshkina and S.A. Mikuli, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences; Institute of Petrochemical Synthesis imeni A.V. Topchiyev, USSR Academy of Sciences, Moscow]

[Abstract] Results are presented from a study of various maleic anhydride copolymers obtained in the olefin polymerization laboratory of the authors' institute from monomers by copolymerization in the presence of radical-type initiators in various solvents. The experiments showed that the maleic anhydride copolymer specimens studied have little toxicity in vitro or in vivo in experiments with mice. Copolymers of divinyl ether and MA containing 5-member oxygen rings and copolymers with furan manifested interferon-inducing properties. Chemical modification of maleic-anhydride-based copolymers was demonstrated to be one means of altering physiological activity. The results indicate that the principle of constructing an antiviral polymer based on the presence of a negative charge with a certain density and the corresponding distribution along the chain in a conformation accessible for interaction with the cell is correct. References 10: 5 Russian, 5 Western.

6508/9835

CSO: 1840/611

PROBLEM OF TREATMENT OF ACQUIRED IMMUNE DEFICIENCY SYNDROME

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 5, Sep-Oct 86 pp 637-638

[Unsigned Editorial]

[Abstract] This editorial, based primarily on the Western literature, mentions some treatments which have been attempted in SPID [i.e., AIDS]: Suramine and HPE-23 reverse transcription inhibitors, phoscarnet DNA-polymerase inhibitor, immune system restoratives such as  $\gamma$ -interferon, interleukin II, T-activin, thymus hormones and bone-marrow transplants, cyclosporin and antibodies to the surface and internal proteins of the AIDS virus. In spite of the few positive results which have been achieved with these treatments and treatment of the opportunistic infections which accompany AIDS, there is not yet sufficient experience to determine their therapeutic potential.

6508/9835

CSO: 1840/611

EFFECT OF PLACENTAL  $\alpha_1$ -MICROGLOBULIN ON PROLIFERATIVE AND CYTOTOXIC ACTIVITY OF MICE LYMPHOCYTES IN VITRO

Moscow IMMUNOLOGIYA in Russian No 6, Nov-Dec 86  
(manuscript received 18 Nov 85) pp 34-37

[Article by L.N. Gulyanskiy, D.D. Petrunin, A.L. Rakhmilevich and I.N. Golovistikov, Smolensk Medical Institute; Second Moscow Medical Institute imeni N.I. Pirogov]

[Abstract] Effect of placental  $\alpha_1$ -microglobulin (PAMG-1) on proliferation of mice lymphocytes stimulated by alloantigens or mitogens was investigated along with cytotoxic activity of killer cells and immune killers. It was shown that at 60-120  $\mu$ g/ml concentrations, PAMG-1 suppressed unidirectional mixed reaction of lymphocytes when administered in the inductive or proliferative phase; it also affected response to phytohemagglutinin and pokeweed mitogen but had no effect on Con-A nor did it modify the activity of natural and immune killers. Overall it shows immunosuppressive action and during pregnancy it acts as an immunoregulator. Figures 1; references 11: 10 Russian, 1 Western.

7813/9835

CSO: 1840/560



# EXPERIMENTAL MODELS OF ACQUIRED IMMUNODEFFICIENCY

Moscow IMMUNOLOGIYA in Russian No 6, Nov-Dec 86 (manuscript received 13 Feb 86) pp 5-7

[Article by R.M. Khaitov, Institute of Immunology, USSR Ministry of Health, Moscow]

[Abstract] Considerable work was done in recent years on acquired immunodeficiency syndrome (AIDS) [--in Russian, SPID] including efforts in blood testing and vaccination. A number of natural and experimental models were developed: feline T-lymphopenia, monkey AIDS (MAIDS). It was shown that the infectious agent in MAIDS is the retrovirus D (related to MPMV). The main difference between MAIDS and AIDS is that in monkeys PC (Pneumocystis carinii) is not the principal opportunistic infection and MAIDS virus does not show such a highly expressed tropism towards T-helper cells as HTLV viruses. After review of various attempts to develop an adequate animal model, it was concluded that chimpanzees infected with AIDS virus and mice with retroviruses LP-BM5 constitute possible animal models. References 22: 2 Russian, 20 Western (2 by Russian authors).

7813/9835  
CSO: 1840/560

# PHYSICAL-CHEMICAL CHARACTERISTICS OF BONE MARROW MEDIATOR STIMULATING ANTIBODY FORMATION

Moscow IMMUNOLOGIYA in Russian No 3, May-Jun 86 (manuscript received 17 Jun 85) pp 35-38

[Article by L.A. Zakharova, A.V. Katlinskiy, R.N. Stepanenko, L.A. Strelkov and A.A. Mikhaylova, Institute of Immunology, USSR Ministry of Health; Institute of Physical-Chemical Medicine, Second Moscow Medical Institute imeni N.I. Pirogov]

[Abstract] Bone marrow stimulator of the formation of antibodies was fractionated on fine pore sephadex and individual fractions were investigated. Six fractions were identified representing a mixture of components with molecular weights of 1300 to 2000D. The stimulating activity was related to various peptide components. Up to 80% of radioactively labelled aminoacid introduced bone marrow suspension was also included in this group. In addition to antibody stimulating property, opiate mimicking compounds were found in the this bone marrow mediator with analgesic properties. They could bind to opiate receptors in brain and in lymphocytes. This binding was affected by peptide ligands because in presence of protease inhibitors

this mediator was more active. Figures 4; references 12: 11 Russian, 1 Western.

7813/9835  
CSO: 1840/556

UDC 612.017.1-06:[613.863-02:612.766.2]

# EFFECT OF IMMOBILIZATION STRESS ON FORMATION AND ACTIVITY OF HUMORAL IMMUNE RESPONSE SUPPRESSORS

Moscow IMMUNOLOGIYA in Russian No 3, May-Jun 86 (manuscript received 6 Dec 84) pp 38-41

[Article by B.A. Frolov, M.S. Blyakher and V.K. Filippov, Orenburg Medical Institute; Moscow Scientific Research Institute of Epidemiology and Microbiology imeni G.N. Gabrichevskiy, RSFSR Ministry of Health]

[Abstract] Immobilization stress was studied as it affected formation of immune response suppressors responsible for depression of antibody formation. Experiments were carried out on mice (CBAx57Bc/6)F<sub>1</sub>; antigen-specific suppressors were generated by making mice tolerant to meningococcal polysaccharide of serum group A by a single injection of the tolerogen preparation. A six-hour immobilization stress resulted in lowering of the relative and absolute content of FC<sub>1</sub>-POK in the spleen which, after 72-120 hrs, returned to normal. Formation and activity of antigen specific suppressors was also affected; during the early stage decreased formation of antigen-specific T suppressors was noted; at a later stage (day 8) antigen-specific suppression was not affected. This difference may be due to the stability of the suppressors formed towards the damaging factors. Figures 2; references 15: 9 Russian, 6 Western.

7813/9835  
CSO: 1840/556

ROLE OF T-LYMPHOCYTES IN PRIMARY IMMUNE RESPONSE TO INACTIVATED FOOT AND MOUTH DISEASE VIRUS ADMINISTERED TO MICE

Moscow IMMUNOLOGIYA in Russian No 3, May-Jun 86 (manuscript received 11 Jan 84)  
pp 87-89

[Article by I.A. Lycheva, A.Ya. Kulberg and V.I. Shorshnev, All Union Scientific Research Institute of Foot and Mouth Disease, USSR Ministry of Agriculture, Vladimir; Scientific Research Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow]

[Abstract] Early immune response of nude B-mice towards immunization with inactivated foot and mouth disease virus was investigated on male mice. It was shown that the protective antigen found in these preparations is relatively independent of thymus reaction. It promotes synthesis of virus neutralizing antibodies of the IgM class in mice with lower T-cell levels or even in those without any T-cells. Figures 1; references 12: 3 Russian, 9 Western.

7813/9835

CSO: 1840/556

GENOMIC AND ANTIGENIC ANALYSIS OF INFLUENZA A (H1N1) VIRUSES ISOLATED IN 1982-1983: SELECTION OF OPTIMUM VACCINE STRAIN

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 12 Jun 85) pp 288-292

[Article by I.I. Akopova, A.I. Klimov, S.S. Unanov, V.P. Krasnova, Ye.B. Grinbaum, T.Ya. Luzyanina and Yu.Z. Gendon, Moscow Scientific Research Institute of Viral Preparations, USSR Ministry of Health; All-Union Scientific Research Institute of Influenza, USSR Ministry of Health, Leningrad]

[Abstract] Genomic and antigenic analysis was conducted on influenza A viruses isolated in the 1982/1983 epidemic season, in comparison with each other and the standard reference virus A/England/33/80 (H1N1) (I) that was in circulation in previous epidemics. Genomic analysis based on hybridization with the cRNA of I demonstrated that all of the 1982/1983 H1N1 isolates differed from I in most of the genes. Thus, A/Leningrad/16/16/82 differed at five genes (1,2,4,5,6), and A/Dunedin/27/83 and A/Chile/1/83 differed in all the genes except gene 8 (NS) from I. The 1982/1983 viruses were thus shown to have undergone further evolution, affecting not only the genes coding for hemagglutinin (gene 4) and neuraminidase (gene 6), but also most of the genes responsible for the nonglycosylated proteins. In addition, A/Dunedin/27/83

was found to differ from A/Chile/1/83 at genes 1, 2, 5 and 6, while A/Leningrad/16/16/82 differed from the A/Chile/1/83 isolate at all genes except gene 8. Antigenic analysis of hemagglutinins with rat antisera and monoclonal antibodies confirmed the antigenic differences, as well as similarities. On this basis A/Leningrad/16/16/82 appears to be the strain of choice for preparation of inactivated vaccines. Figures 2; references 8: 1 Russian, 7 Western.

12172/9835  
CSO: 1840/608

UDC 578.833.27:578.74].083.3

#### MONOCLONAL ANTIBODIES AGAINST ANTIGENS OF JAPANESE ENCEPHALITIS (JP) VIRUS

Moscow VOPROSY VIROSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 13 May 85) pp 314-318

[Article by A.S. Novokhatskiy, I.V. Malakhova, N.V. Loginova, P.G. Deryabin, G.A. Lebedeva and V.A. Aleshkin, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Technical details are presented on the preparation of monoclonal antibodies against JP virus, using immune splenocytes from BALB/c mice for fusion with mouse myeloma cells X63-Ag8/653 and NS-0. Screening with fluorescent antibodies resulted in identification of positive colonies, with subsequent cloning of active cells and amplification in the peritoneal cavities of BALB/c mice. Seven monoclonal antibodies were obtained, with three clones producing IgM antibodies and four clones IgG antibodies. Data are presented on the biological behavior of the hybridomas and their reproduction in the peritoneal cavities (37-86% ascitic tumor production). Two hybridomas, designated EJ-4 and EJ-19, were found highly efficient in serial mouse-to-mouse transfer leading to significant harvesting of monoclonal antibody-containing ascitic fluids. References 15: 6 Russian, 9 Western.

12172/9835  
CSO: 1840/608

CYTOMEGALOVIRUS (CMV) INFECTION AND IMMUNODEFICIENCY

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 19 Jul 85) pp 326-329

[Article by N.A. Farber, S.A. Demidova, V.N. Martynova, L.A. Gomes and O.A. Polyakova, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] The case is presented of a girl (2 yrs, 10 months) who first presented with classical clinical symptoms of CMV disease, 16 months after two blood transfusions because of anemia. CMV was isolated from the urine and saliva. The patient presented with repeated courses of high fever (to 40°C), pain in extremities, hepato- and splenomegaly, lymphadenopathy, anemia, leukopenia, thrombocytopenia and granulocytopenia. Hematologic and immunologic work-ups revealed marked depression of cell-mediated and humoral immunity. Because of her uneventful birth and postnatal development, infection with CMV was assumed to have taken place either via transfusion, or from her mother who was demonstrated to be infected with CMV. References 16: 4 Russian, 12 Western.

12172/9835  
CSO: 1840/608

NOVEL PERORALLY EFFECTIVE INTERFERON INDUCER

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 1 Mar 85) pp 335-338

[Article by F.I. Yershov, A.M. Sayitkulov, E.B. Tazulakhova and A.S. Sadykov, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Trials were conducted in outbred and CBA male mice (10-12 g) to determine the effectiveness of a novel gossypol derivative--Tash-4--in the induction of interferon. Tash-4 was nontoxic in concentrations of 2000 mg/kg on peroral, intraperitoneal, or intramuscular administration. Maximum serum levels of interferon of 1280-2560 IU/ml were obtained with 100 mg/kg Tash-4 on intraperitoneal or intramuscular administration. The highest levels of interferon (640 IU/ml) on per os administration were obtained with 25 mg/kg Tash-4. Maximum interferon concentrations with per os and intraperitoneal administration were seen within 1-2 days, and with intramuscular administration within 4-5 days. Interferon levels in the various organs and tissues were higher than in the blood. In the case of the intestinal tract the interferon levels were 10-fold greater than in the serum. Following a single administration of Tash-4 the animals became



refractory to further administration of the inducer for 5-6 days. However, continuous interferon synthesis was assured by successive administration of Tash-4 and Tash-3 inducers, indicating a different mode of induction by the two gossypol derivatives. Figures 5; references 12: 8 Russian, 4 Western.

12172/9835  
CSO: 1840/608

UDC 578.245.04.08

# INTERFERON INDUCTION BY PERORAL ADMINISTRATION OF HIGH MOLECULAR WEIGHT POLYNUCLEOTIDES

Moscow VOPROSY VIROSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 8 May 85) pp 338-342

[Article by S.S. Grigoryan, F.I. Yershov, V.K. Podgorodnichenko, G.A. Popov and A.M. Poverenny, Institute of Virology imeni D.I. Ivanovskiy (Moscow) and the Scientific Research Institute of Medical Radiology (Obninsk), USSR Academy of Medical Sciences]

[Abstract] Outbred white mice were used to assess the interferon-inducing efficacy of high MW poly-I:C and poly-G:C preparations encapsulated in liposomes on per os and intraperitoneal administration. Administration of either inducer in a dose of 5 mg/kg per os led to serum interferon levels of 320-640 U/ml, while parenteral administration resulted in levels of 640-1280 U/ml. Per os administration of unencapsulated preparation failed to induce interferon synthesis, while the levels on intraperitoneal administration were 2- to 4-fold lower than with the encapsulated preparations. Administration of liposomal inducers favored prolonged persistence of interferon in the blood stream for at least 24 h. The liposomal preparations were found to retain full activity on per os administration after storage at 4°C for 14 days as a suspension, and for 45 days when lyophilized. The per os activity of suspension maintained at 4°C for 6 months was reduced 4-fold. Figures 3; references 11: 2 Russian, 9 Western.

12172/9835  
CSO: 1840/608

NEW DATA ON AIDS AND ITS ETIOLOGIC AGENT

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86 pp 368-370

[Editorial commentary]

[Abstract] Since the last consideration of AIDS in VOPROSY VIRUSOLOGII in January, 1985, additional information has become available and is summarized. The incubation period has now been shown to range from 4 months to 6 years before the onset of the chronic disease process. The latter is characterized by immunodeficiency in which factors dependent on T-helpers cells are particularly affected. Limited clinical benefit has been obtained with the use of interleukin-2, while interferon has not been shown to be beneficial. The two viruses implicated as etiologic agents--LATV-3 and LAV--have been shown to have 70% homology in their RNA molecules. Definite diagnosis rests on demonstration of the viral antigen in lymphocytes and specific antibodies in the sera of patients and carriers. Diagnostic kits (Abbot, USA) have been developed, and are available in the USSR. The mortality figures commonly quoted range around 60-70%, with the outcome predicated on the degree of immunodeficiency.

12172/9835

CSO: 1840/608

## NEW SOVIET TECHNIQUE OF BLOOD VESSEL CORRECTION

Moscow ADVANCES OF SCIENCE AND TECHNOLOGY in English No 7, 5 Mar 87

[Article by Anna Nikolayeva]

[Text] Today, Moscow turner Vladimir Tolstov, 59, can walk painlessly, though three years ago he could hardly take a step unassisted. He suffered from a constricted iliac artery (consequence of atherosclerosis) affecting his left leg.

In such cases, surgeons usually remove the obstructed vessel and replace it with a plastic substitute or a length of the patient's own vein or artery. This is major surgery, and that is especially hard on elderly patients suffering from other conditions as well. Vladimir Tolstov had had two heart attacks and suffered from diabetes mellitus.

The physicians believed that traditional surgery in his case would be extremely risky. Finally, they resorted to a new method developed at the All-Union Research Center of Surgery (USSR Academy of Medical Sciences).

"Vladimir Tolstov was our first patient," says the author of the new technique, Professor Iosif Rabkin. "The new plan of X-ray-screened vascular correction does not call for the knife, general anaesthesia and blood transfusion, so the patient is not scared of the operation. The main advantage of the plan is that it takes a very short time for the patient to recover after the operation. In 5 to 7 days' time he can resume work.

"The new idea is as follows. A catheter is introduced into the constricted part of the blood vessel to expand it, usually through the femoral artery. Actually, this technique is widely used in many international clinics today.

"Our plan is unique because the catheter delivers a length of specially made wire to the affected spot. The body's heat forces the wire to coil and thus prevent the vessel from constricting: we reinforce it from within. The entire procedure is monitored on an X-ray screen."

The method has an interesting history. In 1948, Soviet metallurgical engineer Kudryumov discovered a new effect, now bearing his name. Apparently, some alloys can assume a given shape at a certain temperature. If the temperature is changed and then reestablished, the object made of such an alloy will be able to resume its initial shape.

"When I turned to metallurgy experts and asked them to help me develop a vessel 'frame' based on Kurdyumov's effect, they could not even grasp the idea at first, for metallurgy has very little to do with surgery. Then I showed them the atherosclerotic aorta of a male patient who had died at the age of 45 and said: 'That's what often kills people, and it may happen to any of you, too.' They got my message, and we began to work together."

The engineers obtained the required nickel and titanium alloy. Objects made of it could retain their shape at normal blood temperature. The alloy is biologically inert, that is, it can't be rejected by the body.

"We choose the best possible shape for the frame to be inserted into a particular patient's blood vessel," explained Professor Rabkin. "In close cooperation with the engineers we continue to develop the plan and polish the technique of vessel reinforcement. It is a very sophisticated operation indeed: one has to fix a minute wire to the catheter, push it through to the affected spot and detach it from the catheter. This requires great experience on the surgeon's part, so we are trying to simplify the procedure."

Professor Rabkin believes that the new vessel correction plan is one of the most promising trends in vascular surgery. It makes it possible to preserve the patient's own blood vessel, for atherosclerosis usually affects only a part of it. The new method can be used to treat vessels in all organs, even in the heart. No wonder the technique has drawn the attention of urinologists, gynecologists, oncologists, otorhinolaryngologists and other specialists.

/9835

CSO: 1840/663-E

## CRYOSCALPEL DEVELOPMENT IN USSR

Moscow IZVESTIYA in Russian 4 Mar 87 p 4

[Article by L. Levitskiy, Izvestiya correspondent, Tomsk]

[Abstract] More than six years ago Boris Ilyich Alperov designed the cryo-scalpel, which combines extreme cold ( $-195^{\circ}\text{C}$ ) and ultrasound for bloodless surgery. This instrument is particularly useful in operations on such organs as the liver, and has been successfully employed in more than 250 operations. Although foreign manufacturers have shown considerable interest in the cryoscalpel and have recognized Russian priority in its development, within the USSR its acceptance has been rather slow. Only recently have some funds been allocated to further development of the cryoscalpel. One can only hope that the problem has now been rectified and that the cryoscalpel will become more generally available to the medical profession in the USSR.

12172/9835

CSO: 1840/651



## MICROBIOLOGICAL FERMENTATION OF METHANE

Yerevan KOMMUNIST in Russian 15 Jan 87 p 4

[Article by S. Geoletsyan]

[Abstract] Developments are reported on production of edible protein from petroleum, methane and mineral products by bacteria that emit methane as a by-product that can be used for fuel. At the Central Scientific Research Institute for General and Applied Microbiology of the Armenian SSR Academy of Sciences in Abovyan, scientists have identified and described new varieties of nitrogen fixing, spore-producing and sour-milk bacteria, yeasts and fungi. These new discoveries are of use in producing acid milk and wine, bread, insecticides and fertilizers. New discoveries in bioengineering and biotechnology are being used for protein and fuel production, as well as for biocatalysis. The author describes a meeting at which the Armenian institute signed an agreement to provide an acid-milk-producing microbe to a Japanese firm, the first such arrangement between an Armenian and a "capitalist" enterprise. Microorganisms, such as spiruline, an aquatic microorganism that is readily metabolized by agricultural animals, can be grown on salt flats and produce protein far more rapidly than animals. Spiruline is grown, dehydrated and compressed into tablets to be fed to livestock. Problems which block more effective production by the institute include the lack of experimental production or planning facilities, as well as limited amino-acid production facilities in Armenia. While plans for such facilities are in the works, progress has been slow. There is little available animal waste in Armenia that could be used for methane-based production, although specialists at the institute believe that with proper organization 300 tons of fuel could be produced from the wastes of large state farms.

12313/9835

CSO: 1840/492

## VIRUS LYOPHILIZATION

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 31 Jul 85) pp 275-280

[Article by V.V. Kadetov, V.V. Korol and A.N. Terentyev, Scientific Research Anti plague Institute, Rostov-on-Don]

[Abstract] This is a review of some of the key principles underlying successful lyophilization of viruses. Particular emphasis is placed on the need for rapid freezing of the material below its eutectic point, with precise control of heat input to allow drying from the frozen state without melt-back. Added consideration is accorded to the proper use of cations for stabilization, and the pH range, as well as the use of appropriate preservatives such as antioxidants. Finally, more precise planning of the entire freeze-drying procedure may be anticipated from application of mathematical factor analysis. References 85: 59 Russian, 26 Western.

12172/9835  
CSO: 1840/608

UDC 616.98:578.833]-07:616.153.96-097-078.73

## FLUORESCENT ANTIBODY TECHNIQUE IN STUDIES ON SIMBU GROUP OF BUNYAVIRUSES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 2 Jul 85) pp 351-353

[Article by V.V. Roldugina and L.L. Fadeyeva, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] The indirect fluorescent antibody method was used to detect the accumulation of the Simbu virus in BHK-21 cells, in order to assess the utility of this method for this group of Bunyaviruses. The method was found effective in detecting an increase in the infectious titer from 1.7 to 5.6 log LD<sub>50</sub>/0.02 ml in the tissue culture, beginning with the 12th postinfection hour. This report represents the first demonstration that the fluorescent antibody method is applicable to the Simbu virus. References 5: 3 Russian, 2 Western.

12172/9835  
CSO: 1840/608

## SUITABILITY OF RAMT CELL LINE FOR PROPAGATING VACCINE VIRUS STRAINS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 6, Nov-Dec 86  
(manuscript received 10 Oct 85) pp 718-722

[Article by V.P. Grachev, M.A. Zavalnyy, V.D. Popova, M.K. Khanina, G.P. Baranova, V.I. Stobetskiy and G.A. Alpatova, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] Studies were conducted with RAMT cell line, derived originally from the African green monkey kidney, to assess its suitability for propagation of viruses. This cell line is resistant to 8-azaguanine, 6-mercaptopurine, and 6-thioguanine, and deficient in hypoxanthine-guanine phosphoribosyltransferase. The RAMT cells were found to be nontumorigenic in experimental mice, while examination of RAMT cell cytoplasm following staining with Hoechst-33258 stain failed to show DNA inclusions, indicating that this line is free of DNA-containing microorganisms. Sublines were obtained which grew well in 0.1 and 1% serum obtained from different sources, e.g., calf serum, in comparison with the parental cells that required 10% serum. These cells were found to support high titers of various viruses, such as Coxsackie, ECHO II, and tick-borne encephalitis virus. Figures 1; references 17: 6 Russian, 11 Western.

12172/9835

CSO: 1840/612

## ACTIVATION OF ALPHAVIRUS REPRODUCTION IN CELL CULTURE BY ALKALINE pH

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 6, Nov-Dec 86  
(manuscript received 22 Nov 85) pp 723-729

[Article by O.P. Zhirnov, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Chick embryo fibroblast and hamster BHK cell cultures were used to assess the effects of pH on the rate of alphavirus reproduction, using a system in which 20 mM HEPES was used to control the pH over a 6.8 to 8.0 range. The desired pH was obtained by addition of NaOH. The data demonstrated that a mildly alkaline pH of 7.5-7.9 had a marked effect on the rate of reproduction of Semliki forest virus, Sindbis virus, and Venezuelan equine encephalomyelitis virus. At pH 7.7 the rate of viral protein production was 40-50% greater than at pH 7.0. In addition, at the alkaline pH values viral binding to the cellular receptors was reduced by 30-50%. These observations were also utilized in plaque detection by using alkaline agar overlays. The latter made possible visual examination of plaques within 1 to 1.5 days, versus the 2 to 3 days required with conventional neutral

agar overlays. Figures 3; references 28: 6 Russian, 22 Western.

12172/9835  
CSO: 1840/612

UDC 579.871.1.04:578.81].08

BIOLOGICAL AND CERTAIN PHYSICAL-CHEMICAL PROPERTIES OF CORNEBACTERIUM  
DIPHThERIAE B (FREEMAN)  $\varphi$ 984 and  $\varphi$ 9 PHAGES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 5, Sep-Oct 86  
(manuscript received 28 May 85) pp 577-584

[Article by A.A. Kovgan, A.F. Bobkov, E.V. Karamov, A.A. Manykin,  
M.M. Garayev and V.M. Zhdanov, Institute of Virology, imeni D.I. Ivanovskiy,  
USSR Academy of Medical Sciences, Moscow]

[Abstract] The major pathogenic properties of the diphtheria pathogen of *Corynebacterium diphtheriae* result from its ability to secrete a protein toxin into the host. The toxin formation gene is located on a chromosome in certain groups of corynephages; lysogenization causes appearance of the phenotype tox+. The structural and functional specifics of organization of the genome of the toxicogenic phages have been recently studied. However, there is no information in the literature on methods of producing preparative quantities of these phages, required for gene-engineering experiments. The authors attempted to develop a fast, convenient method for production of phage suspensions with high titer. This article describes a method of producing suspension of corynephages BF,  $\varphi$ 984 and  $\varphi$ 9 with high titers on solid nutrient media using cellophane substrates, and presents results of experiments studying some of the biological and physical-chemical properties of these phages. Figures 3; references 12: 2 Russian, 10 Western.

6508/9835  
CSO: 1840/611

# CONCENTRATION OF VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS IN TWO-PHASE WATER-SOLUBLE POLYMER SYSTEM

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 5, Sep-Oct 86  
(manuscript received 10 Jan 86) pp 584-587

[Article by V.G. Pomelova, S.Ya. Gaydamovich, V.A. Demenev and Yu.P. Kadoshnikov, Institute of Virology, imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] The method of distribution in two-phase systems of water-soluble polymers has not been widely used in virology. This work presents data on the basic parameters of the process of concentration of the VEE virus in a polymer system and the results of electron microscope monitoring of individual stages of the concentration. The method suggested for purifying and concentrating the virus in the two-phase polyethylene glycol-dextran sulfate system yields viral preparations concentrated by a factor of about 100 after the first stage, 190 after the second stage and 300 after the third stage. Simply changing the NaCl content of the system shifts the virus from one phase to the other. The purity of the preparation increases greatly during concentration. Figure 1; references 8: 5 Russian, 3 Western.

6508/9835  
CSO: 1840/611

# EFFECT OF MINERAL SALTS ON FORMATION OF EXOTOXINS AND PRODUCTIVITY OF BACILLUS THURINGIENSIS CULTURE

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 3, May-Jun 86  
(manuscript received 7 Dec 84) pp 440-444

[Article by L.I. Abrosimova, P.V. Babayeva, G.M. Zubareva and V.V. Shevtsov, All Union Scientific Research Institute of Applied Microbiology, Obolensk]

[Abstract] Effect of mineral salts on productivity, formation of exotoxin and insecticidal activity of sporocrystalline complex of *B. thuringiensis* culture subspecies *thuringiensis* was investigated. Optimal ionic composition of the culture medium was established. It was shown that  $Fe^{2+}$  ions added to the medium (0.2 to 3 mg per 100 ml) considerably increased productivity of the culture. The following salts also stimulated formation of exotoxin:  $MnSO_4$ ,  $ZnSO_4$ ,  $(NH_4)_2SO_4$  and  $KH_2PO_4$ . Optimal composition of the culture medium yielded  $5 \cdot 10^9$  spores per milliliter with exotoxin yield of 737.3 ug/ml. Thermal resistance and entomopathogenic activity of crystals increased



when *B. thuringiensis* IPM-1140 was grown in this medium. References 11: 10 Russian, 1 Western.

7813/9835

CSO: 1840/564

#### ABILITY OF MARINE BACTERIA TO BIOSYNTHESIZE FIBRINOLYTIC ENZYMES

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 3, May-Jun 86  
(manuscript received 28 Jun 83) pp 445-448

[Article by N.S. Yegorov, N.S. Landau, M.N. Lebedeva (deceased) and L.G. Gutveyb, Moscow State University imeni M.V. Lomonosov]

[Abstract] The goal of this work was to isolate marine microorganisms from water, detritus, intestines of bottom and pelagic fish and to study their physiological-biochemical characteristics, especially their ability to synthesize thrombolytic enzymes of direct hydrolytic action on principal protein thrombo-fibrin. The cultures were isolated from mediterranean-type seas (Black, Balearic and Carribean). A procedure was developed for isolation of enzyme preparations with high specific fibrinolytic activity and low caseinolytic activity. The most active agents were isolated from mineral detritus and ruff intestines from the Black Sea. Intensive formation of fibrinolytic enzymes by marine bacteria occurred in a medium containing glycerine, sodium nitrate and mineral salts. Figures 1; references 16: 11 Russian, 5 Western.

7813/9835

CSO: 1840/564

UDC 579.222.2-711.5

#### BACTERIA DECOMPOSING INDUSTRIAL OILS

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 3, May-Jun 86  
(manuscript received 23 Aug 85) pp 526-527

[Article by Ye.G. Toropova, G.V. Matyusha and A.A. Belousova, Department of Biology, Moscow State University imeni M.V. Lomonosov]

[Abstract] The goal of this study was to identify bacterial cultures from industrial oils which were stored for different time lengths under varying conditions. From 60 oil samples of 19 different brands, 50 bacteria cultures were isolated of which 20 decomposed industrial oils. Twelve of these were of the *B. subtilis* strain, five of *B. pumilus* and one each of *B. licheniformis*, *B. cereus* and *B. alvei*. The least resistant to bacterial decomposition were the oils MK-8+10% Akor-1, AS-8, MS-8p, MN-7, 5U and IMP-10. The isolated

spore cultures were more active than *Mycobacterium lacticolum* and *Pseudomonas aeruginosa*. References 5 (Russian).

7813/9835

CSO: 1840/564

UDC 579.845.02

#### SULFUR CYCLE THERMOPHILIC BACTERIA FROM CORROSION ZONES OF STEEL CONSTRUCTIONS IN MUNICIPAL HEATING SYSTEMS AND IN SOIL

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 1, Jan-Feb 86  
(manuscript received 21 Jun 84) pp 105-112

[Article by R.S. Golovacheva, Ye.P. Rozanova and G.I. Karavayko, Institute of Microbiology, USSR Academy of Sciences, Moscow]

[Abstract] The goal of this study was to detect thermophilic bacteria of the sulfur cycle at sites of high pressure heating network in Moscow and in the neighboring grounds considering them as potential cause of steel corrosion. Among such corrosion products sulfate reduction microorganism *Desulfatococcus nigrificans* was identified along with sulfur reducing bacteria belonging to thermoproteus genus. A pure culture of aerobic facultative thermophilic eubacterium *Sulfobacillus thermosulfidooxidans* was isolated. A hypothesis was postulated that these bacteria participate in the corrosion processes and should be considered as dangerous agents in designing new networks. Figures 4; references 18: 5 Russian (1 by Western authors), 13 Western.

7813/9835

CSO: 1840/562

UDC 579.[65 + 8]

#### TAXONOMIC POSITION OF MICROORGANISMS ISOLATED FROM STRATOSPHERE AND MESOSPHERE

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 1, Jan-Feb 86  
(manuscript received 4 Apr 84) pp 113-115

[Article by A.A. Imshenetskiy, S.V. Lysenko, T.Yu. Petrukhina and T.P. Sizova, Institute of Microbiology, USSR Academy of Sciences, Moscow; Moscow State University imeni M.V. Lomonosov]

[Abstract] Previous papers reported on collection of material from heights of 51-84 km by a specially constructed microbiological rocket impactor.

Presently taxonomic analysis of the upper atmosphere microorganisms was undertaken. All the cultures belong to already known species: *Penicillium mucor*, *Scopulariopsis*, *Aspergillus*, *Cladosporium*. Characteristically, pigmented forms predominated which was responsible for their resistance to the action of sun rays. References 20: 6 Russian (1 by Western authors), 14 Western.

7813/9835  
CSO: 1840/562

UDC 535.37:579.84

BIOLUMINESCENT EVALUATION METHOD OF TOXICITY OF COLORED SUBSTANCES IN  
EFFLUENT FROM SULFATE-CELLULOSE INDUSTRY

Moscow MIKROBIOLOGIYA in Russian Vol 55, No 1, Jan-Feb 86  
(manuscript received 16 Oct 84) pp 152-154

[Article by L.N. Novikova, T.A. Gil, A.R. Rudykh and D.I. Stom,  
Scientific Research Institute of Biology at the Irkutsk State University  
Imeni A.A. Zhdanov]

[Abstract] The goal of this work was to find a possible relationship between physical-chemical properties of colored substances and the damping of bioluminescence of *Beneckea Harveyi* bacteria. Such substances showed a rather low toxicity towards bacteria, diminishing intensity of their luminescence by 23-29% at a concentration of  $10^{-3}$  M/l. Separation of individual components at pH 1 made it possible to determine their specific effect on bacteria. This biotest was shown to be rapid and highly reproducible; therefore it could be used to evaluate toxicity of the effluent from sulfate cellulose industry which contains colored materials difficult to oxidize. A relationship was established between color intensity of the tested materials and the intensity of bacterial bioluminescence which provided a measure of the effluent toxicity. Figures 3; references 5: 4 Russian, 1 Western.

7813/9835  
CSO: 1840/562

## USE OF MICROFILTRATION IN PRODUCTION OF INACTIVATED INFLUENZA VACCINES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 4, Jul-Aug 86  
(manuscript received 19 Feb 85) pp 404-409

[Article by N.B. Ivanov, V.P. Zhemkov, V.I. Gromov, A.N. Cherkasov,  
L.A. Shashkov and V.P. Mirnyy, All-Union Scientific Research Institute  
of Highly Purified Biopreparations, Leningrad]

[Abstract] Trials were conducted with microfiltration as a convenient technique for the preparation of inactivated influenza virus vaccines, using virus-containing allantoic fluid as the starting material following preliminary purification by column chromatography. Filtration involved cellulose acetate Biopore AM filters with 0.06-0.08  $\mu$ m pore diameters, as well as MFA-AM No 1 filters in a UFM-100 apparatus. The buffer system consisted of 0.05 M tris, pH 7.2-7.4. The method was found very efficient in assuring recovery of influenza viruses from low-titer allantoic fluids that would have been otherwise discarded, and in providing pure viral preparation free of protein impurities. Subcutaneous vaccinations of animals and human clinical trials demonstrated the vaccines to be essentially areactogenic. Use of bivalent vaccine combinations resulted in 4-fold or greater increases in specific passive hemagglutination inhibition titers. Figures 1; references 11: 8 Russian, 3 Western.

12172/9835  
CSO: 1840/609

## REDUCTION OF INFECTIVITY OF ENVELOPED VIRUSES WITH RETENTION OF SPECIFIC BIOLOGICAL ACTIVITY OF VIRAL PROTEINS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 4, Jul-Aug 86  
(manuscript received 18 Jul 85) pp 475-479

[Article by V.E. Berezin, A.F. Artamonov, Ye.S. Isayeva, V.M. Zaydes and V.M. Zhdanov, Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Studies on the development of a universally-applicable method for the inactivation of enveloped viruses led to the identification of the nonionic detergent MESK as providing the reagent of choice. MESK was found to diminish the infectivity of influenza A, herpes simplex and VEE viruses for chick embryos or chick embryo fibroblast cultures by 10 log ID<sub>50</sub> units. However, basic biological properties of attendant viral proteins, such as hemagglutinin and neuraminidase activities, were

unaffected by incubation of the virus-containing allantoic fluids with MESK for 30 min at 4°C. Inactivation was also achieved with incubation with MESK conducted in the presence of 2% BSA, 5% human gamma-globulin, or 50% serum. The ease with which MESK was removed by dialysis was an additional factor favoring the use of MESK. The mechanism of inactivation was attributed to solubilization of the glycoprotein complex of the envelopes. Figures 1; references 20: 11 Russian, 9 Western.

12172/9835  
CSO: 1840/609

UDC 577.224.46.044+632.937.15

CHEMICAL MUTAGENESIS AND USE OF INDIRECT ENZYMIC CRITERIA FOR SELECTION OF BACILLUS THURINGIENSIS VIRULENT CLONES

Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 22, No 4, Jul-Aug 86 (manuscript received 23 Jan 84) pp 543-547

[Article by V.S. Slavnova, A.D. Chigaleyshik, A.L. Mazanov and V.V. Shevtsov, All-Union Scientific Research Institute of Applied Microbiology]

[Abstract] Induction of mutants of entomopathogenic microorganisms of the *Bacillus thuringiensis* group is important for production of highly-active strains which can be used to produce biological preparations. The absence of rapidly-obtained and reliable criteria for selection of *Bac. thuringiensis* mutants with fixed properties greatly impedes selection work with this group; therefore, production of induced *Bac. thuringiensis* mutants with altered virulence was performed and some enzymic reactions in them were studied in order to determine correlative traits associated with virulence. *Bac. thuringiensis* subsp. *galleriae* st. 69/6 was studied after exposure to the mutagen N-methyl-N'-nitro-N-nitrosoguanidine. The effect of nitrosoguanidine on percentage survival of *Bac. thuringiensis* subsp. *galleriae* st. 69/6 depended upon the physiological state of the culture, the pH of the medium, the mutagen dosage and the length of exposure to the mutagen. The mutagen has maximum mutagenic effect on vegetative cells at pH 6.2 and on spores at pH 5.6. The possibility of using indirect biochemical tests to select virulent and avirulent clones of *Bac. thuringiensis* is discussed. A modified method of determining penicillinase activity of entomopathogenic bacteria is described. Almost all slightly virulent clones displayed high proteolytic activity and very low penicillinase activity. The enzymic tests are suitable for use in stepped selection of highly active strains of *Bac. thuringiensis*. Figures 3; references 16: 9 Russian, 7 Western.

2791/9835  
CSO: 1840/550



# EFFECT OF SOME FACTORS ON BIOSYNTHESIS OF ALKALOIDS BY CLAVICEPS CP II

Moscow PRIKLADNAYA BIOKIMIYA I MIKROBIOLOGIYA in Russian Vol 22, No 4, Jul-Aug 86 (manuscript received 6 Aug 84) pp 548-553

[Article by A.G. Kozlovskiy, T.F. Solovyeva, L. Slokoska and I. Grigorov, Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino; Institute of Microbiology, Bulgarian Academy of Sciences, Sophia]

[Abstract] Claviceps CP II produces a group of clavine alkaloids including elymoclavine, a prolactin inhibitor which may be useful in breast cancer therapy. Selection of conditions of cultivation of Claviceps CP II which promote increase of alkaloids yield due to change of the carbohydrate component of the nutrient medium composition, aeration, application of surfactants and tryptophan is described and discussed. The capacity of Claviceps to produce alkaloids and the intensity of the process depended greatly upon the nature of the carbohydrate component of the medium. Comparative study of alkaloid formation by a Claviceps CP II culture upon substitution of other carbohydrates for sucrose showed that significant formation of alkaloids also occurred after use of galactose, maltose and sorbitol. Use of xylose, lactose and glucose was practically ineffective in alkaloids production. During culturing of Claviceps CP II on medium T<sub>25</sub>, the highest alkaloid yield occurred with initial sucrose concentration at 30 percent. Intensification of aeration increased the yield and Tween 80 in 0.05 concentration increased it. The insignificant increase of alkaloid yield after application of L-tryptophan, in comparison with the control, was attributed to the role of tryptophan as a precursor. References 12: 7 Russian, 5 Western.

2791/9835

CSO: 1840/550

UDC 579.833.29:579.53].083.12

# ISOLATION OF VIRAL STRAINS OF HEMORRHAGIC FEVER WITH RENAL SYNDROME FROM PATIENTS AND RODENTS ON CELL CULTURES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 2, Mar-Apr 86 (manuscript received 16 May 85) pp 180-183

[Article by R.A. Slonova, T.I. Astakhova, Ye.A. Tkachenko, T.K. Dzagurova, O.V. Pavlenko, A.N. Bondarenko, M.Ye. Kosoy and Ye.L. Kushnarev, Scientific Research Institute of Epidemiology and Microbiology, Siberian Department of the USSR Academy of Medical Sciences, Vladivostok; Institute of Poliomyelitis and Viral Encephalitis, USSR Academy of Medical Sciences, Moscow]

[Abstract] Isolation of Vero E6 viral strain of hemorrhagic fever with renal syndrome (HFRS) from patients and rodents captured in southern Far East was

reported along with the characteristics of isolated strains. This virus showed serologic similarities with Hantaan virus; it was found in three rodent species: *Ap. peninsulae*, *Cl. rutilus* and *Cl. rufocanus* and in blood of three patients and several organs of a deceased individual. Isolation of virus from blood indicates an etiologic role of serotype I in development of infection and its generalization. References 12: 3 Russian, 9 Western (1 by Russian authors).

7813/9835  
CSO: 1840/607

UDC 578.833,26:578.53

#### CHANGEABILITY OF TICK-BORNE ENCEPHALITIS (TBE) VIRUS ON PASSAGE IN IXODID TICKS AND SMALL MAMMALS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian  
No 6, Nov-Dec 86 (manuscript received 14 Feb 86) pp 58-61

[Article by S.P. Chunikhin, I.N. Reshetnikov and V.N. Lyapustin,  
Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of  
Medical Sciences, Moscow]

[Abstract] To assess changes in arboviruses as a result of passage in Ixodid ticks, five strains of TBE virus (UK-101, UK-124, PK-36, PK-183, PK-20) were evaluated biologically after 11 to 25 passages. Cultivation in the ticks led to a reduction in the size of the plaques formed in swine embryonic kidney cell culture from 4-6 mm to less than 1 mm. In addition, in some cases the index of infectivity increased. However, strain PK-20, defined as 'naturally attenuated', escaped such changes, forming plaques less than 1 mm in diameter before and after passage in the ticks. All the strains, with the exception of PK-20, exhibited considerable peripheral activity in albino mice, activity that was considerably attenuated by tick passage. The changes in the biological properties of strains UK-101, UK-124, PK-36 and PK-183 were correlated with the loss of a viral antigen showing cathodal migration in immunoelectrophoretic studies. This antigen was not detected in PK-20, suggesting that it may be a factor in virulence of the TBE virus. Figures 1; references 14: 7 Russian, 7 Western.

12172/9835  
CSO: 1840/601

# REPRODUCTION CHARACTERISTICS OF INFLUENZA A EPIDEMIC VIRUSES IN CELL CULTURES

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 2, Mar 86  
(manuscript received 17 Oct 84) pp 137-142

[Article by I.N. Lavrentyeva, \*T.Ye. Medvedeva and D.B. Golubev, All Union Scientific Research Institute of Influenza, USSR Ministry of Health, Leningrad; \*Scientific Research Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad]

[Abstract] The goal of this work was to investigate reproductive potential in cell cultures of human influenza A viruses with different levels of virulence: A/Victoria/35/72 (80% reactivity in humans) and A/Bangkok/1/79 (30%). Three cell cultures were used: human kidney embryo (HK), human lung embryo (HL) and chicken kidney embryo (CK). Under conditions of high level of infection (1 EID<sub>50</sub> per cell) the virus showed no difference in reproductive ability in any of the cell cultures studies; with 0.001 EID<sub>50</sub> per cell, the highly virulent A/Victoria/35/72 virus reproduced actively in all cultures and trypsin appeared to have no effect on this process. The A/Bangkok/1/79 virus reproduced only in CK cultures; in presence of trypsin it also reproduced in HK culture. Figures 2; references 5: 2 Russian, 3 Western.

7813/9835  
CSO: 1840/584

UDC 548.737+547.963+615.33

X-RAY STRUCTURAL STUDY OF SPECIFIC INHIBITOR OF REVERSE TRANSCRIPTASE  
3'-AZIDO-2',3'-DIDESOXYTHYMIDINE

Moscow DOKLADY AKADEMII NAUK in Russian Vol 291, No 4, Dec 86  
(manuscript received 24 Apr 86) pp 854-859

[Article by G.V. Gurskaya, Ye.N. Tsapkina, N.V. Skaptsova, A.A. Krayevskiy, S.V. Lindeman and Yu.T. Struchkov, Institute of Molecular Biology, USSR Academy of Sciences, Moscow; Institute of Heteroorganic Compounds imeni A.N. Nesmeyanov, USSR Academy of Sciences, Moscow]

[Abstract] 3'-Substituted analogs of 2'-desoxynucleosides in form of 5'-triphosphates are strong inhibitors of DNA synthesis in cell free systems with pure enzymes. Attaching themselves to 3'-terminal of the polynucleotide chain they stop its enlargement. Among many such agents, two are specific inhibitors of reverse transcriptase of avian myeloblastosis virus: dNTP(3'N<sub>3</sub>) and araNTP(3'N<sub>3</sub>). The spacial structure of [dT(3'N<sub>3</sub>)](3'-azido-2',3'-didesoxythymidine) was investigated. Two crystallographically-independent structures of dT(3'N<sub>3</sub>) were observed. Their conformation resembled that of natural thymidine. Specificity of dT(3'N<sub>3</sub>) was determined by the presence of an azide "probe" imitating distribution of O3'-H groups in natural nucleotides with a rigid structure and a precise orientation in respect to the furanose ring; the C3' atom in this furanose ring is an exo position. Detailed values for bond length and the angles were tabulated. Figures 1; references 12: 3 Russian, 9 Western (2 by Russian authors).

7813/9835  
CSO: 1840/579

UDC 616.98:578.832.1]-092-02:615.251.8]-07

SYNERGISTIC THERAPEUTIC EFFECTS OF APROTININ AND REMANTADINE IN EXPERIMENTAL INFLUENZA

Moscow VOPROSY VIRUSOLOGII in Russian Vol 31, No 3, May-Jun 86  
(manuscript received 30 May 85) pp 292-297

[Article by O.P. Zhirnov, Institute of Virology imeni D.I. Ivanovskiy,  
USSR Academy of Medical Sciences, Moscow]

[Abstract] Experimental trials were conducted with two antivirals in outbred albino mice infected with influenza A/Aichi2/68 (H3N2) virus. The animals were infected intranasally with a ca. 400 LD<sub>50</sub>/mouse dose of the virus, and within 20-30 min were treated i.p. with either aprotinin (2000 kallikrein-inhibiting units (KIU)), remantadine (100 µg), or 2000 KIU aprotinin + 100 µg remantadine combination. The respective chemotherapies were repeated at 5-6 h intervals and continued for 7.5 days. Determination of 7 days survival rates yielded a figure of 9% for the untreated control animals, 12% for the remantadine-only animals, 36% for the mice on aprotinin, and 72% for the mice on combined chemotherapy. These findings demonstrated the efficacy and synergistic therapeutic advantage of a combination of two antivirals with different modes of activity. Figures 3; references 38: 12 Russian, 26 Western.

121/2/9835  
CSO: 1840/608



EFFECTIVE COMPLEXES OF ANTILEUKEMIC L-ASPARAGINASE ENZYME WITH DEXTRANE SULFATE

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 32, No 4, Jul-Aug 86  
(manuscript received 22 Jan 85) pp 47-51

[Article by A.S. Karsakevich, A.Zh. Dauvarte, I.K. Zvirgzda, L.V. Lebedeva and I.A. Vina, Institute of Organic Synthesis, LatSSR Academy of Sciences, Riga]

[Abstract] Many medicinal-use enzymes are not very effective because of their poor stability, toxicity, allergenic and antigenic properties etc. To improve them, they are usually complexed with polymers which provide effective screens for protection and, on occasion, even alter some of their properties. One of such polymers is dextran sulfate (DS). Experimental results were reported of the study of enzymic and antileukemic properties of L-asparaginase complexed with DS. This complex showed better storage characteristics at elevated temperatures and resistance to proteolysis. Increased antileukemic activity was observed on mice (leukemia L5178y). Using L-asparaginase complexes with DS made it possible to decrease substantially the dose of this enzyme for therapeutic purposes. Evidently DS neutralized immunosuppressive activity of L-asparaginase. Figures 1; references 24: 4 Russian, 20 Western.

7813/9835  
CSO: 1840/590

UDC 616.006.615.287.3

EFFECTS OF NOVEL ANTINEOPLASTIC BLASTOZOLE ON NUCLEIC ACID LEVELS AND DNA SYNTHESIS IN CANCER CELLS

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 2, Feb 87  
(manuscript received 28 Apr 86) pp 78-80

[Article by S.N. Chernenkaya, N.Ye. Kucherenko and A.I. Kutovoy, Institute of Molecular Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] The novel, alkylating antineoplastic blastozole (diethylene aminothiophosphoryl-2-trichloromethyl- $\Delta^2$ -imidazole) was tested for its effects on nucleic acid levels and on rate of DNA synthesis in cancer cells. The studies conducted with outbred mice and Wistar rats transplanted with Guerin's carcinoma, sarcoma-45 or Ehrlich's carcinoma cells demonstrated that blastozole exerted an inhibitory effect on DNA levels in splenic, hepatic, and brain cells, as well as in the tumor cells. Depression of

RNA was less pronounced. In addition, studies with the Ehrlich cells demonstrated depression on DNA synthesis during the first 6-8 days, with no effects thereafter. In addition, the optimum scheme for intragastric administration involved 24 h intervals (20-40 mg/kg). Figures 1; references 13: 1 Ukrainian, 11 Russian, 1 Western.

12172/9835

CSO: 1840/629

#### PROPHYLACTIC EFFECTIVENESS OF EPSILON-AMINOCAPROIC ACID (EACA) ON INFLUENZA IN MICE

Bratislava ACTA VIROLOGICA in Russian Vol 30, No 1, Jan 86  
(manuscript received 17 Jan 85) pp 58-62

[Article by L.Ye. Puzis, V.P. Lozitskiy and R.Ya. Polyak, Scientific Research Institute of Virology and Epidemiology imeni I.I. Mechnikov, Odessa]

[Abstract] Therapeutic trials were conducted with EACA in outbred albino mice to determine its effectiveness vs. influenza viruses differing in pathogenicity. A single subcutaneous administration of 15 mg AECA 2 or 10 days before infection of the mice with 2 or 10 LD<sub>50</sub> doses of influenza virus AO/32 (HON1) (Pathogenic for mice) improved the survival rate by 20-30%. At the termination of the experiment (14 days) the difference in the LD<sub>50</sub> between control and experimental groups was equivalent to 1.9 log<sub>10</sub>. Studies with influenza virus A/Hong Kong/1/68 (H3N2), unadapted to murine lungs, showed that, in animals pretreated with EACA, there was a direct correlation between appearance of antibodies in the blood and reduction in infectious virus in the lungs. Although the mechanism of action by which EACA exerts its protective and therapeutic effects vis-a-vis influenza has not been elucidated, its activation of antiviral immunity has been established. Figures 1; references 16: 15 Russian, 1 Western.

12172/9835

CSO: 1840/583

UDC 577.352.5:612.822

EFFECTS OF DOUBLE-STRANDED RNA ON PACEMAKER NEURON MEMBRANE PROCESSES

Yerevan NEYROKHIMIYA in Russian Vol 5, No 3, Jul-Sep 86  
(manuscript received 26 Nov 85) pp 239-247

[Article by R.A. Zakharyan, G.Ye. Rychkov, S.S. Dadalyan, I.S. Bakunts, A.S. Agabalyan, L.A. Rukhkyan and S.N. Ayrapetyan, Institute of Experimental Biology, Armenian SSR Academy of Sciences, Yerevan]

[Abstract] Perfusion and electrophysiological studies were conducted on the effects of yeast double-stranded (ds) RNA on discharges of a pacemaker neuron (RPa1) isolated from the snail *Helix pomatia*. Studies at 20°C demonstrated that 2 µg/ml dsRNA led to marked increase in the amplitude of fluctuations in the membrane potential, along with a decrease in the frequency of discharge. Return to baseline electrical activity was obtained by washing the preparation with dsRNA-free Ringer's solution. At 7°C dsRNA was without effect on pacemaker activity. In combination with other determinations, dsRNA-mediated hyperpolarization of pacemaker neurons was attributed to stimulation of the sodium pump, implicating the latter with a trigger function in the initiation of pacemaker activity. In addition, analysis of the effects of dsRNA in relation to  $Ca^{2+}$  concentration in the perfusate demonstrated a direct correlation with elevated intracellular level of cAMP accompanying intracellular influx of  $Ca^{2+}$ . Figures 5; references 20: 7 Russian, 13 Western.

12172/9835  
CSO: 1840/593

## EFFECTS OF NEUROHORMONES K AND C ON LEVELS OF ARGINASE ACTIVITY IN RAT BRAIN IN LIVER

Yerevan NEYROKHIMIYA in Russian Vol 5, No 3, Jul-Sep 86  
(manuscript received 7 Feb 86) pp 297-301

[Article by K.A. Galoyan, M.A. Davtyan\* and R.M. Srapionyan, Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan; \*Yerevan State University]

[Abstract] To date, the effects of neurohormones K and C on nitrogen metabolism have been neglected, particularly with respect to the ornithine cycle. Studies on Wistar rats (150-250 g) demonstrated that injection of either hormone into the jugular vein led to depression of arginase activities in the brain and the liver. A similar effect was obtained in in vitro studies. The demonstration that neurohormones K and C affect ureotelic and nonureotelic arginase activities in the rat demonstrate the need for further studies on the physiological significance of these neuroendocrine factors. References 8: 6 Russian, 2 Western.

12172/9835  
CSO: 1840/593

UDC 616.8-009.24-02:615.835.12]-07:616.831-008.939.6-074

## BRAIN SYNAPTOSOME MEMBRANE PROTEINS DURING CONVULSIONS CAUSED BY ELEVATED OXYGEN PRESSURE

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian Vol 32, No 4, Jul-Aug 86  
(manuscript received 10 May 85) pp 35-37

[Article by K.B. Sherstnev and A.K. Suleymanov, Scientific Research Institute of Biology; Department of Biochemistry, Rostov University]

[Abstract] Protein components of brain synaptosome membranes were studied on white rats during acute oxygen intoxication. Under such conditions a drop in the content of low molecular weight fractions was observed along with an increase in high MW fractions; this was due to oligomerization of membrane proteins with lipid peroxidase oxidation products. No significant changes were observed in the amino acid composition of synaptosomal membrane proteins except for histidine which increased by 29%. Incorporation of  $^{14}\text{C}$ -leucine into these proteins was inhibited indicating possible effect on the protein biosynthesis. Figures 2; references 14: 4 Russian, 10 Western.

7813/9835  
CSO: 1840/590

INTERVIEW WITH CHAZOV ON HEALTH MINISTRY'S PROBLEMS, GOALS

Moscow PRAVDA in Russian 13 Apr 87 p 3

[Report on interview with USSR Minister of Health, Academician E. Chazov by correspondent O. Frantsen: "A Most Important Item in the Social Sphere: A Formula for Health"; date of interview not given; first paragraph is PRAVDA introduction]

[Text] The considerable significance attached to public health in our country also places great demands on the performance of health services. In recent years the state of affairs in this sector has been subjected to sharp criticism, including criticism from articles that have appeared in our newspaper. PRAVDA has also written about the defective style of operations at the USSR Ministry of Health. Today, the Ministry of Health apparatus has been significantly reformed. Our correspondent interviewed the new USSR Ministry of Health, Academician Ye. Chazov about the problems facing the health sector and ways to resolve them.

[Question] Many letters are received by the PRAVDA editors from persons who are perplexed at how the most humanitarian profession in the most humanitarian society could begin to suffer from a lack of care for people.

[Answer] It is quite natural that the shortcomings in the health sector have met with pointed criticism from the people. But that sector could not avoid the negative phenomena that were piling up in our society in the recent past.

While making justifiable high level demands on the health sector, society must accord that sector a corresponding degree of attention. Life has demonstrated the faulty nature of the so-called residual planning principle whereby the health sector is given whatever is left over after the requirements of the other sectors that are deemed more important have been satisfied. Inasmuch as our health is admittedly our most valuable asset, the health sector must be financed on an optimal per capita basis. It must be admitted that medical personnel both in the ministerial apparatus and on the local level have until recently been very timid about this matter.

But of course the problem is not merely one of resources. Resources can be managed well or poorly. Unfortunately, the practice of public health as it has been evolving in our country has been long dominated by a pursuit of



quantitative factors to the detriment of quality work, conservatism in management and economics, reluctance on the part of lower rank institutions to act independently and assert initiative, and an unwillingness to recognize the work value of material incentives. As a result of such methods, in the last 15 -- 20 years not only has the developmental rate of public health slowed, but serious problems have emerged that will not be easily resolved. We know that at a time when we should have undertaken an immediate correction of the situation, we repeatedly cited our advances in the customary way.

Incidentally, the other extreme of the spectrum would be to ignore those advances, as is now sometimes being done in the heat of our polemics. The accomplishments of the world's first socialist state in the establishment and development of a national health service are imposing and indisputable. The first free and universally accessible medical care system in the history of humankind as proclaimed by V. I. Lenin, became a model for many countries of the world, and not just the socialist countries. Thus, the principles of first aid in the USSR were adopted by the World Health Organization in structuring its concept of health organization.

But that which was suitable yesterday may not be satisfactory tomorrow. It would be dangerous to forget this rule of life.

[Question] My next question may seem absurd: What should medical personnel be engaged in? But it is just that way that many representatives of your profession perceive the question. Of course, in the treatment of patients! they would answer. But health maintenance goes far beyond the purview of medicine. What is your opinion on that point?

[Answer] You have touched upon a fundamental health problem -- the problem of its ideology. This requires serious consideration. However, the basis of that ideology is generally recognized, i.e., priority must be given to prevention. But this must be done in a consistent manner. And it is here that we still have trouble. The essentially correct proposition about "common care" has spilled over into a situation where too many cooks have spoiled the broth. Of course, common efforts are required, but they should be under a unified leadership. If everyone is made answerable, no one is.

Many soviet and managerial personnel have forgotten about the existence of the state comprehensive program for prevention in which over 70 ministries and departments, in addition to the Ministry of Health and All-Union Central Trade Union Council, are active. And once more, the medics are afraid of disturbing them. Consequently, many parts of this plan are not being fulfilled. Only 47 of the 196 environmental protection assignments stipulated in party and government decrees have been fulfilled.

The level of pollution in 104 cities of the country is ten or more times greater than the established hygienic standards. One-fourth of the municipal water systems and one-third of the departmental systems are supplying water without sufficient purification. And here medical personnel are racking their brains about the causes of acute intestinal infection outbreaks...

We know that the fatality rate of premature infants is 20 times greater than it is for full term infants. In that connection that fact must be alarming. Whereas premature infants comprise an average of 4.9 percent of newly born infants in the country as a whole, up to eight or more percent of premature infants are born to women workers in certain sectors. This should be pondered by supervisors in the industrial rubber and paint and varnish industries as well as in plastic and synthetic fiber manufacturing plants.

A good quality of foodstuffs is not always maintained. Foods are spoiled both during their storage and manufacture. Thus, there have been cases of food poisoning among children, including those at pioneer camps and kindergartens, where children have consumed spoiled products made by the meat and dairy industry of the State Agroindustrial Committee.

Medical personnel are giving little attention to the operation of sanatorium-prevention centers, the development of physical culture, and the propagation of a healthy life style as a whole.

By not exhibiting sufficient energy in such matters and even trying to remain aloof from them altogether, the medical profession has been reducing itself to the level of a unique type of repair service. It can and must control all the links in the health chain of which doctoring is only a small part. Only then will the medical profession fully correspond to its lofty intended role -- to safeguard human health and active long life.

[Question] Apparently, a proper way of life plays a special role. This vigorous healthy method is accessible to everyone and doesn't require any expenditures.

[Answer] It's the other way around. It has a beneficial effect on the family budget. A reasonable diet, the non-use of alcohol and tobacco, all of that saves money. The main thing, of course, is that it preserves one's health and life itself.

During the present decade about one million persons in our country will die of lung cancer, or in other words, from smoking. Between 1965 and 1985 the morbidity rate of lung cancer doubled in our country. Just consider the fact that tobacco sales have increased, not decreased, in spite of our announced campaign against smoking. As you can see, this struggle has been ineffective so far. Medical personnel are also to blame for that situation. But smokers themselves must finally realize the seriousness of their habit. They are harming not only themselves but those around them, including their own children.

Of course it's not easy to break habits that have been established over years. That is why it is so important to form good health habits from childhood. Thus far, that opportunity is being poorly exploited.

Why is it that healthy habits are not formed in the schools even though they are of such everyday importance? And I don't just mean physical culture. If, for example, we talk some more about smoking, we know that it begins in the schools. The staff of the cardiology center undertook a study and came up

with the terrible fact that 40 percent of the 16 year-old youngsters smoke. A teenager smokes out of curiosity and a desire to demonstrate his boldness. Later they find that it is difficult to give up cigarettes. We must help the youngster to formulate a correct psychological attitude. Prohibitions and boring admonitions will be of little effect here.

And something else. Some fears are expressed that a knowledge about the human body will stimulate juvenile sexuality. I am convinced that this would not happen. On the contrary, our unnecessary reticence and rejection of proper sex education can cause great harm. A vacuum is formed that is filled by "courtyard education" which later often leads to tragedies.

[Question] It is surprising but true that many medical personnel do not heed their own recommendations about a healthy way of life. One doesn't have to go very far to cite examples. They can be easily found at the very Ministry of Health. Just take the question of smoking...

[Answer] I am ashamed to talk about that. Of course, our smokers must ask themselves whether they have the moral right to work on a health services staff. We should begin with myself. Then, all the country's medical workers should quit their harmful habits in order to publicize not by words, but by personal example, the value of a healthy way of life.

[Question] Our conversation has now apparently come to questions about therapeutic work...

[Answer] Today we have more physicians than ever before: Over 1,200,000. At the same time, the professional skill level of many of them is low. In a recent certifying examination of 350,000 physicians, almost one out of ten was certified conditionally, and one thousand physicians were removed from medical work altogether. Young specialists are often unable to deliver babies, perform the simplest of operations, or read an electrocardiogram. We are planning not only to improve the training and retraining of physicians, but to scrutinize their qualifications more thoroughly. Thus, we are now talking of issuing a paramedic certificate instead of a physician's diploma to those candidates who are not sufficiently qualified.

We shall decisively rid ourselves of the occasional person in medicine who cannot or does not want to carry out the demands placed on medicine, and who is discrediting the title of Soviet medical specialist. We are considering the necessary legal steps that must be taken which would allow us to rescind these persons' medical diplomas.

We also have a record number of hospital beds -- more than 3,300,000. But in attempting to fulfill the hospital bed plan at any cost, the councils of ministers of the union republics and the local Soviets, with the silent, and often active agreement of the health authorities, have embarked on a unique form of fraudulent reporting: They have opened up hospitals in dormitories and residential buildings that have been built below the cost of the original plans. Even the hospital wings that were built in complete conformity to the original plans leave much to be desired. The plans themselves do not correspond to the demands of the times.



The repair and reconstruction of old buildings is another pressing problem. Existing and new hospitals must be fully supplied with medical and technical equipment and provided with a sufficient quantity of medication and patient care items. Plans have been made to provide qualified engineering-technical servicing of the presently available equipment. Equipment repair is now often undertaken by the medical personnel themselves with unfortunate results. Here we are very dependent upon other ministries and departments. And although we have had assurances that our needs will be met, experience has shown that persistence is necessary. We are ready for that.

There is one more important new development. A considerable portion of patient examinations and treatment will be transferred to the polyclinics and dispensaries. The hospitals will be primarily engaged in the treatment and diagnosis of very difficult cases.

All of this will not only improve but accelerate hospital treatment and will relieve the wards that are presently overloaded. The normal space allotment per bed is seven square meters, but in fact it is 4.2. Relieving the pressure on hospital bed resources is both justified and economical. Hospital bed space is expensive and should be utilized only when actually necessary.

[Question] Will there not be difficulties in transferring the burden from one place to another, and will not this adversely affect the polyclinics which are already inundated by the flow of patients?

[Answer] No, that's not going to happen. The out-patient clinic-polyclinic link will be significantly strengthened. Our network of consultation-diagnostic divisions and polyclinics is already being expanded. We have decided to introduce a new type of institution -- a diagnostic center which will specialize in the application of complex diagnostic methods that are not readily available today. Existing out-patient clinics and polyclinics will be outfitted to handle a higher level of treatment, including the performance of simple surgery procedures.

[Question] Stomatologist L. Shaposhnikov from Sevastopol has written us that the system of evaluating the work of specialists on the basis of the number of patients received reduces the quality of treatment. Moreover, in attempting to set up 16 to 25 visits within a period of five and one-half hours, the stomatologist is simply not able to do everything that needs to be done. And the patient often returns to him many times even though one visit might have been sufficient. The same sort of thing is taking place in other medical offices. Under these circumstances physicians are often apprehensive about the universal preventive medical examination program. In addition, many patients complain about why we should have to have such an examination which is conducted hastily and concluded without any concise recommendations?

[Answer] Inasmuch as we want to raise the quality of treatment, we must also evaluate our work correspondingly. The qualitative evaluation factors will apply throughout our public health system. This primarily applies to the district physician who has the greatest contact with people. He must be judged not by the number of calls he makes and the number of patients he

receives, as is the case now, but by the health of the 1,800 persons assigned to him. And the patient must have the right to select a physician whom he trusts. This too will be an incentive for medics.

Of course, in addition to the physician's interest in the quality of his work, the physician must have the opportunity to give the patient attentive care. In the near future he will be relieved of unnecessary paper work. We shall review the time limits for patient visits. The physician must not only be controlled, but he should also be trusted more. In that connection, incidentally, we and the All-Union Central Trade Union Council have jointly organized an experiment in a number of oblasts and one rayon of Moscow in which the physicians will be able to write out orders for hospital stays of up to 10 days. We hope that experiment will prove to be successful. After all, we know that in a number of cases frequent visits to a physician are not necessary. They overload the polyclinic and can even exacerbate the course of the illness. If the experiment turns out to be successful this system will be extended universally as early as next year.

Under such conditions the physician will have a vested interest in preventive medicine and will be able to be engaged in its most important element -- general preventive medical examinations. We shall not attempt a hasty implementation of universal preventive medical examinations. That would only discredit a good cause. The system will be introduced gradually as local appropriate conditions permit. We believe that it will be fully operational by 1995.

Orientation of one's work toward quality and the end result can be a powerful incentive. If a district physician knows that the attitude toward him and his well-being depend primarily on the health of his wards, he will strive to prevent illnesses inasmuch as prevention of a disease is much easier than its cure.

[Question] Then the district physician who is supposed to know family health and anticipate its development will inevitably go into hygiene and sanitation. But surely there are already medical subdivisions that are engaged in those activities, such as the sanitation-epidemiological stations and sanitary education houses. True, they are almost not available at the family level. Then, would it not be advisable, as Professor A. Bykhovskiy has suggested, to consolidate district physicians, the sanitation-epidemiological stations, and sanitary education, and even the medical-physical culture out-patient clinics into preventive subdivisions that could control the entire complex of measures needed to maintain the health of a microregion's residents?

[Answer] We shall definitely get to that point eventually, only it won't be today or tomorrow. Being a realist, I must say that we do not yet have the needed conditions to implement fully what you are proposing. I hope you and I will live long enough to see it happen.

[Question] But if that project is so important, we should start working on it now by setting up the conditions for its realization.



[Answer] I agree. We are thinking about it. We have, for example, organized a preventive medicine department in the Ministry. There have been lengthy disputes about to whom the department should be subordinate. To the deputy minister who oversees the therapeutic main administrations, or to the person who is in charge of sanitation. We decided it should be the latter. Thus, the embryo for what you were proposing has emerged within the structure of the ministry.

[Question] Readers have been expressing their readiness to help in the financing of the health sector. It has been suggested that a health fund might be set up on the basis of voluntary dues, that special loan bonds might be issued, that a "Health" lottery or "Health Lotto" (similar to "Sport Lotto") could be organized, and that special taxes could be exacted from persons who are irresponsible in caring for their own health. There are some who think that we are now able to pay in part or even in full for medical treatment.

[Answer] Guaranteed free medical care constitutes an important social achievement of our people. The fact that we have become wealthier is hardly reason to reject it. An illness will not ask you whether you have money to pay for its treatment. And then what happens if there isn't any money when it's needed?...But, if you are talking about non vitally critical services, then payment for medical services is possible. We are planning to double the volume of services offered by cost-accounting polyclinics by 1995. However, I repeat once more, priority medical assistance will be guaranteed at the conventional polyclinic.

[Question] We have already begun to look into the question of setting up a health fund that would combine various supplemental sources of financing. I would mention the following source that is already available: Funds from plants, factories, sovkhoses, and kolkhoses. Together with the All-Union Central Trade Union Council, we are looking into the possibility of establishing a sanatorium-dispensary at each enterprise employing more than 5,000 workers. We believe that organizations should allocate money for their own health institutions and for such institutions in their territory. Another possible alternative would be for the organization to pay at least part of the medical costs of each of its workers.

The All-Union Central Trade Union Council will meet us half way on this proposal. We have already agreed that the monies saved by cutting down on disability time will be allocated for health needs. Twenty thousand places will be reserved at trade union sanatoria for patient rehabilitation. The Soviet Red Cross has also promised to help. It seems to me that the imposition of a special tax on smoking, although not a very large one, such as a three to five kopeck surcharge on tobacco, would be justified. That surcharge money could be used for the treatment of diseases caused by smoking which must now be paid by the state. The health fund might also receive voluntary contributions from citizens.

Health care is really a matter of common concern. However, this should not be taken to mean, as was already mentioned, the removal of medical personnel from a number of key problems.

[Question] You have given a reassuring reply to each question. But our very well experienced readers would probably ask this final question: "We have heard a lot of promises. Won't it be the same now as it was before?"

[Answer] No, it won't! Neither the party nor the government, nor the entire Soviet people can be reconciled any longer with the situation at hand. And that goes for the medical profession too.

6289

CSO: 1840/626

## MICROMED-JOINT SOVIET-HUNGARIAN ENTERPRISE

Moscow NEW TIMES in English No 14, 13 Apr 87 pp 26-27

[Article by Aleksandr Kuzmin and Boris Kozlov]

[Text] Micromed is the name of the first joint Hungarian-Soviet enterprise commissioned in Hungary for the production of automated diagnostic sets for mass checkups of the population. This modern medical equipment is a result of the fusion of Hungarian microprocessor technology and Soviet research.

Micromed was founded by the All-Union Scientific Research Institute of Medical Engineering (VNIIMP) and the Hungarian firm Medicor. It is a marriage at once of specialists in the two countries, and of science and industry.

### The Partners

Medicor is located in Budapest and has subsidiaries in many towns in the republic, including Eszfergom. It produces about 400 types of medical equipment and more than 2,000 types of medical instruments. More than half of the output is exported to almost 70 countries, the Soviet Union being one of Medicor's biggest customers.

Medicor's products are specialized and labor-intensive. By using the latest achievements of science and perfecting its technology, the enterprise is not only expanding the range of its output but is also quickly switching to the manufacture of ever more advanced medical equipment and instruments. Medicor manufactures x-ray generators, portable diagnostic instruments such as myographs and electrocardiographs, in short, everything that is so rapidly and irreversibly joining the arsenal of contemporary medicine.

VNIIMP is primarily responsible for research and development. Vladimir Viktorov, Doctor of Sciences and director of the institute, is rightly called one of the fathers of Micromed. He recalls how the idea arose, at first seeming just a seductive idea but with time winning many dedicated supporters.

"Why did we team up?" he repeated the question. "The time factor made it essential. Look how rapidly scientific solutions and technologies succeed each other in the course of manufacturing equipment. It is hard to keep pace

with these changes... It is also clear that the production capacities we are now creating as a result of the merger will, on the one hand, free each side of the need to import from capitalist countries and, on the other, enable us to appear on the international market."

"When did you begin to feel this?"

"About three years ago we proposed setting up a joint enterprise and did a feasibility study. The idea is quite simple: we have research facilities and new research and development, but our industry is slow in getting production off the ground. At the same time our Hungarian colleagues have a dynamic modern production base. By joining forces we can create an enterprise responsive to new scientific ideas and the demands of the world market. For instance, if microprocessor technology is used in the production of medical equipment, any doctor will be able to carry in his pocket, say, a portable cardiograph that is as convenient and simple to handle as an electronic wrist watch...."

### The Beginning

Says Istvan Martos, director-general of Medicor: "We began by looking together with Soviet colleagues for local resources to set up a joint enterprise. We decided to use one of Medicor's subsidiaries as a base, the precision mechanics and electronics plant in Esztergom.

"Everything Micromed does, including marketing, is based on principles of self-financing. The charter of the new enterprises takes its specific features into account, but in practical terms has copied the legal norms of other mixed enterprises already operating in Hungary.

"An authorized capital of 168 million forints was established to underwrite Micromed's operations. Each partner contributed an equal share. The Hungarian share consisted of material assets while the Soviet side made its contribution in cash. To meet new expenditure (as from 1988) for production needs it is intended to increase the authorized capital by another 56 million forints. The profits of the enterprise, including those in freely convertible currency, are to be shared out equally between the founders after compulsory payments have been deducted. It is still difficult to predict the profits but I will give you the following figures as an illustration: Medicor's production program envisages an annual output of 100 million rubles by 1991 and thereafter, of 280 million rubles."

A further question to Istvan Martos: "What are the main difficulties now encountered by the joint enterprise?"

"Any number of impediments of the same type have been revealed in the economies of our countries, as have common questions that require solutions. First, there is the problem of price structuring, which follows a different pattern in our two countries, different methods of labor remuneration and mutual deliveries. There are also many legal factors.... But, still, our ship is under way."

A question to Vladimir Viktorov, the VNIIMP director: "What is being done to overcome these difficulties?"

"'Draw up proposals to remove the impediments and we will remove them,' we were told at the USSR Council of Ministers. And we are now preparing such proposals with due account for the main objective--to retain the system of prompt deliveries of components and reduce to the minimum--one month--the time needed to develop new products. This will take a tremendous effort."

"In that case, could I have a frank answer to the following question: would it not have been simpler to continue working in the old way? Could we have done the job without the Hungarians, or the Hungarians without us?"

"In theory we could have done it in eight-ten years. We would need time to design and build the enterprises and fit them out with equipment... But by then we would have discovered that the equipment had become obsolete and new equipment was necessary. So the do-it-yourself approach will not work. We would have wasted money and still failed to catch up with world progress. Things are different with the joint enterprise: we are starting production in April. Take this cardiograph, for instance," and he lovingly displayed on his palm a thin box, smaller in size than a pocket calculator. "We have already spent more than a million on the development of this beauty. But whereas in the past we would get our investment back at best within a period of ten years, at our joint enterprise we will start making profits and recouping our investment as early as April."

"You mean that Micromed will bring in profits from the outset?"

"Since the plant has gone into operation, profits must flow back as well--in rubles, forints and the currencies of third countries. We intend during the first three-four years to spend our profits on expanding production, and thereafter on social needs and requirements. We intend to establish ourselves firmly on the international market, offering new models and new products every year."

#### The Plant

It is not hard to find the precision mechanics and electronics plant in Esztergom. The buildings are visible from a long way off. And director Bela Badi is well known in the town, having devoted almost twenty years to producing medical equipment and instruments. In the near future he will have to stand for election to the post of director of Micromed. People in a position to know say he is a worthy candidate. He has won a State Prize for developing a system of new generation microprocessor diagnostic equipment.

"We know that Micromed will be a trailblazer in solving many questions of restructuring cooperation," the director says. "We have ventured into the unknown but there are some points of reference with which we are already familiar: thus, the number one task is to synchronize our work with that of our Soviet partners, as taking part in the production of equipment under the Micromed trademark are the Moscow plant RfM, and enterprises in Lvov and several other Soviet cities. Quality is a special concern. We have



decided to do without centralized quality control in order to avoid additional outlays of time and money. We are introducing checks at the final stage of production and after delivery."

The appearance of Micromed is a milestone in socialist integration. Many collectives at large industrial enterprises and research institutions in the two countries will have to pass the difficult test of maturity. The time is not far off when similar enterprises will be set up in the key industries of our countries-transport, electronics and engineering.

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#### COMPUTER HEALTH DIAGNOSTIC SYSTEM

Moscow CMEA: ECONOMIC COOPERATION in English No 3, 1986 p 76

[Unattributed news item]

[Excerpt] An electronic doctors therapist was created in the All Union Research Institute on Automation of Control in the Non-Industrial Sphere (Soviet Union). The automated screening system is capable of performing up to 200 medical examinations a day.

The examinations carried out by the machine are compared with the data of earlier examinations encoded in computers. Thus the result is a whole film showing the dynamics of the changes that take place in the organism; it permits the diagnosis of diseases in their initial stage.

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CSO: 1840/662-E

## CEMA COOPERATION IN PUBLIC HEALTH

Moscow CMEA: ECONOMIC COOPERATION in English No 3, 1986 pp 85-88

[Unattributed new items]

[Excerpts] In the successful development of care of public health of the CEMA member countries an important role is played by the close cooperation of these countries over many years. In the course of the first post-war years such cooperation was effected principally on a bilateral basis. Following the experience of Soviet public health care, the people's democratic countries laid the foundation of specialist health services.

Starting with the middle of the 50s, a multilateral cooperation has been developing. In this period, new forms of multilateral relations were established, including conferences of health ministers. In these conferences, since 1956, the up-to-date problems of public health care those of training medical personnel, further those of the proper prophylaxis etc., are reviewed.

It has become clear that the success of further cooperation depends first of all on a precise system of organizing and planning the foundations.

In 1975, at the 29th meeting of the CEMA Session a decision was passed on establishing the CEMA Standing Commission for Cooperation in Health Care which has now entered its second decade.

Bulgaria, Cuba, Czechoslovakia, the GDR, Hungary, Mongolia, Poland, the Soviet Union and Vietnam participate in the work of this Commission. The principal aim of the Commission is to promote a further deepening and improving of multilateral scientific and technological cooperation and the progress of public health care, medicine and also pharmaceuticals.

Comprehensive problems, the Commission is in charge of cooperation on 15 comprehensive and other problems. Such problems include cardiovascular complaints, malignant tumors, the hygiene of the environment including workplaces, infections (including viral diseases such as influenza) and immunization. Improving the organization and management of public health care, the transplantation of organs and tissues, the development of pharmaceuticals and medical techniques are all done jointly.

Three hundred and fifty scientific organizations of the CEMA member countries working on about 200 problems participate in this cooperation.

In order to raise efficiency the International System of Scientific and Medical Information (Medinform) has been established.

Multilateral scientific and technological cooperation on the most important comprehensive problems is carried out on the basis of signed agreements.

Joint elaboration of many problems included in the programs is carried out on the basis of multi- and bilateral contracts in which the research tasks to be fulfilled are clearly distributed between the cooperating institutions. The programs include both basic research as well as work of an applied character. That is why their results are of great theoretical and practical significance.

International centers are organized around the leading scientific research institutes of the CEMA member countries for coordination of cooperation. Such centers deal with malignant tumors, cardiovascular complaints, etc.

Concrete elaborations in the form of agreed methodical recommendations on prophylaxis, diagnosis and treatment are confirmed by the Commission and passed on to the countries for practical use. More than 90 new diagnostic and therapeutic methods have been recommended.

The following have to be specially emphasized. Within the complex of problems Health of the Population and Organization of the Public Health in the CEMA Member Countries methodical recommendations have been prepared on the technical problems of automated systems for management and planning. Such recommendations are already in use. Analytical and evaluating methods have been prepared to establish the medical, social and economic efficiency of mass prophylaxis and that of the systems of dispensaries: recommendations for diagnosis and proposals; methods to establish forecasts as to personnel needs, etc. Experimental designs for hospital institutions elaborated in close cooperation by the experts of all the countries are approved and recommended by the Commission.

A hundred and twenty-six medical institutions of the CEMA member countries participate in research on cardio-vascular complaints. As a result of their cooperation, practical recommendations are made. Such recommendations concern new methods in the prophylaxis, diagnosis and therapy of hypertension, the rehabilitation of patients having suffered myocardial infarction and surgical methods of treating cardiovascular infarction diseases. The program of fighting hypertension envisages the participation of medical services. Where prophylaxis is satisfactory, exact directions are found for lessening the prevalence of this and other cardiovascular complaints. This fact is proved by the results agreed by experts from Cuba, Czechoslovakia, the GDR, Hungary, Poland and the Soviet Union.

As a result of the research done, new data have been found on the mechanism of sudden death and methods have been worked out to prevent it. Cardiologists from Czechoslovakia, the GDR, Hungary and the Soviet Union have established an original system for the automatic analysis of cardiograms. This system is better than analogous systems elsewhere, it underwent clinical trials and industrial production is underway.

Joint research on cancer gave rise to new diagnostic and therapeutic methods. A method of diagnosing lung cancer and growths on the head and neck by using helium-citrate 67 promises early diagnosis.

New methods of radiation therapy have been worked out and are being introduced to treat cancer of the mouth. These new methods are no less efficient than surgery, however they preserve the function of the organs. Highly efficient and new are methods for the treatment of lung cancer using radiation therapy prior to surgery. The new cytological method of early diagnosis of certain cancers has been much praised.

Much has been done in tumor immunology in studying cancerogenous chemicals.

The scientific research programs on the problems of environment hygiene and occupational diseases are being successfully implemented. Specialists of the socialist countries have prepared and agreed on documents governing pollution limits. An index system characterizing changes in the state of health of the public depending on the influence of environmental factors has been recommended. Admissible concentration limits of carbon-disulphide and methods to define those limits have been standardized.

Many of these normative documents, methodologies and recommendations are utilized in the legislation of the CEMA member countries. The morbidity rate of people active in industry and agriculture has declined as a result.

Intertransplant, the Agreement on the International System of Kidney Transplantation signed in 1980, has started a new line in multilateral cooperation. Within this conservative system, problems of tissue incompatibility and those of the conservation of human organs for transplantation have been successfully worked out. A mutual transfer of donors' kidneys is organized between the signatory countries of the Agreement which was joined in Cuba in 1984. This was made possible by the joint methods of longer storage.

Cooperation on the comprehensive problems of research evaluation and standardization of pharmaceuticals permitted the possibility of finalizing the preparation of the unified documents serving the trials of new drugs in CEMA member countries as well as joint trials of such medicines.

The utilization of unified research methods and methods of evaluating new medicines makes it possible to significantly shorten the time of introduction of drugs, saving money on repeat research, and preventing side-effects.



Scientists and specialists of the CEMA member countries actively participate in work on a wide range of vaccines and serums for the prophylaxis and treatment of common infections (influenza, hepatitis, measles, poliomyelitis, meningitis, etc). The production of such vaccines and serums is constantly increasing, the volume of traded quantities is also becoming larger and larger.

In order to improve the provision of medical equipment and pharmaceuticals, decreasing imports from capitalist countries, the Commission is elaborating a list of long-term requirements of the CEMA member countries. The CEMA Committee for Cooperation in Mechanical Engineering and the CEMA Standing Commission for Cooperation in the Chemical Industry will then organize specialized production. In the course of the present five year period, the specialized production of more than 20 new instruments and more than 30 new pharmaceuticals has been put into effect. The Commission is coordinating assistance rendered by the CEMA member countries to Cuba, Mongolia, and Vietnam in accelerating the development of their public health care. A wide range of measures is being taken. Highly qualified specialists are trained for Cuba, Mongolia and Vietnam by all the CEMA member countries. Significant coordinated assistance is being rendered by the CEMA member countries and technical base and raising the standard of public health care in those countries.

Specialists from CEMA member countries visited Cuba in order to render assistance in developing the service of transplantation of organs and tissues and also to deliver lectures, hold consultations and to make surgical demonstrations. Within the General Agreement on Accelerating the Development of Science in Vietnam and Cuba, scientific programs have been prepared on tropical diseases, pharmaceutical raw materials, and natural substances. In Vietnam, a temporary international scientific team has been made up to fight malaria and its carriers.

Regular contacts. The Council for Economic Mutual Assistance maintains regular contacts with other international organizations on public health care. For several years an exchange of informations, materials and documents has been taking place between the CEMA, the WHO, its European regional office and UNEP.

The CEMA member countries actively participate in WHO activities concerning assistance to developing countries in public health care as well as in preventing nuclear war and disarmament, realizing the Strategy of Health for Everybody by the Year 2000. In accordance with the initiative of the socialist countries, a resolution under the title Role of Physicians and Other Medical Workers in Maintaining and Strengthening Peace, this being the most important condition of bringing health to everybody, was passed by the 36th WHO Session. It is emphasized by this resolution that nuclear arms represent the greatest direct danger for the health and welfare of mankind.

Commemorating the 40th anniversary of the UN as well as the 40th anniversary of the Victory won over Nazism and Fascism in the Second World War, a joint declaration of the socialist countries and several developing countries

Afghanistan, Laos, Mozambique, Nicaragua, Yemen---was distributed at the 38th WHO Session in 1985. This declaration invites all WHO member states to strengthen their efforts in order to liquidate the danger of war and to assure the fundamental right of mankind the right to live and right to health.

Major assistance is being rendered by the CEMA countries to developing states in building institutions for public health, and the provision with equipment, drugs and training of medical personnel.

Several thousands of physicians from CEMA member countries are active in more than 70 developing countries in Asia, Africa and Latin America.

Results and prospects. Summing up the results of ten years of cooperation, it can be remarked with satisfaction that the CEMA member countries--joining their efforts--grant the possibility for the inhabitants of the CEMA member countries to spend less on health while obtaining better results.

Due to constant support by the Communist and Workers' Parties and governments of the CEMA member countries, care of public health has reached high standards. Nevertheless not all the problems have disappeared. As was emphasized by Mikhail Gorbachev at the Plenary Session of the CPSU held in April 1985 "Public health and Education gain larger and larger significance in the life of each and all and clearly enough also in the social policy of the Party. We have scored major success, these most important blessings are equally available to all citizens. However, in these days new tasks have arisen there as well."

Scientific and technological progress and its acceleration in order to further raise public welfare as envisaged by the decisions of the Summit Economic Conference of the CEMA Member Countries fully apply also to public health. The roads leading to this aim are concretized in several decisions made by the Session and by the Executive Committee of the Council held after the Moscow Conference, in particular by the Comprehensive Program of Scientific and Technological Progress of the CEMA Member Countries up to the Year 2000 adopted by the 41st (extraordinary) CEMA Session.

The activities performed by the Commission are based on these documents which will be implemented. The working plan of the Commission for the years 1986-87 envisages the deepening of cooperation, utilizing the most efficient forms of organization.

These new and higher requirements are clearly reflected in the planned scientific and technological cooperation of the CEMA member countries in medicine and public health for the years 1986-1990. The said plan was discussed at the 16th Session of the Commission. Such discussion showed that the scientific and technical potential of the socialist countries is aimed at coping with the most up-to-date problems related to protecting the health of inhabitants extending the active working life of the members of socialist society.

The plan envisages 15 directions for cooperation. They include programs for the prophylaxis and therapy of cardiovascular complaints, research into

the malignant degeneration of cells on a molecular level, finding prophylactic methods to relate to viral diseases, and the production of new, efficient immuno-biological preparations.

Priority research in biotechnology, gene engineering, establishment of modern medical equipment, microprocessors and automated complexes to carry out mass prophylactic screening are important.

The efforts being made by leading scientific centers of the socialist countries will be aimed at research into most efficient medicines and hormones. The ratio of comprehensive research concerning the problems of the environment, food, environmental pollution, and the improvement of laboratory diagnostics will be higher.

An immense research program will take place into child mortality, feeding systems and improving perinatal health.

The implementation of such an immense cooperation program envisages improvement of the methods used and seeking new ones. Together with successful cooperation done on the basis of multi- and bilateral agreements and contracts, the establishment of temporary scientific international teams and laboratories will become general.

Most important tasks of long-term cooperation will remain the problems of further improving public health by modern medical equipment and efficient drugs to extend and deepen the scientific and technological cooperation and to accelerate the introduction of the results in the practice of the socialist countries.

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PRINCIPAL RESULTS OF COMPLETION OF TOPICAL PROGRAM--DEVELOPMENT AND  
IMPLEMENTATION OF SCIENTIFIC PRINCIPLES OF LASTING TOTAL COUNTRY-WIDE  
ERADICATION OF MALARIA

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 5,  
Sep-Oct 86 (manuscript received 5 Mar 86) pp 3-7

[Article by V.S. Orlov, R.L. Kuznetsov and A.M. Baranova, Institute of  
Medical Parasitology and Tropical Medicine imeni Ye.I. Martsinovskiy, USSR  
Ministry of Health, Moscow]

[Abstract] Malaria continues to be a problem in the USSR mainly because  
of constant reintroduction from abroad and occasional renewal in previously  
clear areas. Principal directions of the title scientific program plan  
included: improvement of current methods of controlling malaria and intro-  
duction of new ones; preventive measures, especially for individuals working  
in sub-tropical areas; ecological-epidemiological investigation of malaria;  
evaluation of past experience in the USSR in control of malaria and its  
applicability in developing countries with socialistic orientation; study  
of malaria pathogens and host-carrier interactions; education of parasitolo-  
gists, entomologists and other scientists, in the field of malaria. Informa-  
tion from the USSR and from abroad was collected and analyzed and special  
publications on the topic of malaria have appeared. Malaria carriers were  
monitored in respect to their sensitivity to chemical pesticides and new  
agents were introduced. Larvicidal activity of floating diphos granules  
was evaluated by field tests. The monograph "Experience in Control and  
Liquidation of Malaria in Socialist Countries" was published. Many  
scientists throughout the country participated in basic biological studies  
of the disease carriers. References 18 (Russian).

7813/9835  
CSO: 1840/600

## HEART TRANSPLANT PROBLEMS

Moscow LITERATURNAYA GAZETA in Russian 18 Feb 87 p 15

[Article by V. Burakovskiy, academician, USSR Academy of Medical Sciences]

[Abstract] This is a summary of reasons for the slowness of progress in heart transplant surgery in the USSR. A discussion of the matter noted that the scientific secretary of the Academy of Medical Sciences did not even listen to the arguments for initiating heart transplant procedures. Official approval for transplant studies was followed by slow and incomprehensible progress, while the director of heart transplant work has never been interested in that aspect of surgery. At meetings where the issue was discussed, Burakovskiy was the only heart surgeon in attendance. He has advocated advances in general organ transplant operations in Moscow, but has noted little results from his initiatives. He concludes that the science of transplant surgery in general and of the heart in particular requires and deserves careful attention, discussion with surgeons in preparation for such operations; in Soviet medicine, however, no such preliminary work has taken place. Rather, it would appear that assurances that everything is fine have replaced timely, concrete solutions to the problem of slow progress in Soviet heart transplant surgery.

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CSO: 1840/493

## HOSPITAL RENOVATION AND PUBLIC-SPIRITED CITIZENS

Moscow EKONOMICHESKAYA GAZETA in Russian No 7, Feb 87 p 23

[Article by B. Shul'man, Chief Physician, Clinical Hospital No 6]

[Abstract] The article reports on renovation of the obsolete member of paired hospitals, Clinical Hospital No 6, which began as a hospital for the poor in the 19th century, reached a size of 800 beds, and had fallen into general disrepair when it was joined with the better-maintained Hospital No 42 in 1980. Medical equipment in Hospital No 6 was 30 years old, it had no nutritional facilities or laboratories. When the budget, provided for renovation, was seen clearly to be totally inadequate, the staff sought assistance from party leaders of the Bauman Party Raykom and the Rayon Executive Committee. Those leaders in turn enlisted aid from local enterprises. The Ministry of Petroleum and Gas Construction branch helped to build administration and cafeteria facilities as well as other capital equipment. When the Moscow Testing and Experimental Plant was unable to renovate the elevators in the next 8 years, engineers and technicians in the area spent their spare time to rebuild them immediately in two months. Other prominent leaders employed highly original accounting and acquisitions



procedures to get specialized medical equipment, under other names, to the hospital. Both "minor" nomenclature changes and simple misspellings were used successfully to circumvent regulations and the USSR State Bank. The author severely criticizes the local medical authorities and city agencies responsible for health needs, while praising interested but indirectly related leaders for helping in every possible way.

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TRENDS AND PROSPECTS IN VIROLOGY IN LATVIAN SSR

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 11, Nov 86  
pp 3-13

[Article by R.A. Kukayn]

[Abstract] A brief review is presented of previous research activities and anticipated investigations in virology conducted at the Institute of Microbiology imeni Avgust Kirkhenshteyn of the Latvian SSR Academy of Sciences. The studies conducted at the Institute have encompassed and shall encompass fundamental questions concerning the nature and biology of viruses, and also, practical aspects pertaining to human and animal infections, their prevention, diagnosis, and treatment. Of particular importance in the research plans of the Institute are studies concerned with the immunological aspects of viral infections and their chemotherapy. References 61: 48 Russian, 13 Western.

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USE OF INTERFERON INDUCER IN PREVENTION AND TREATMENT OF ACUTE VIRAL DISEASES IN CALVES

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 11, Nov 86  
(manuscript received 3 Jan 86) pp 108-110

[Article by V.Ya. Mozgis, Z.E. Anderson, Ya.R. Bluzmanis, G.Ya. Feldmane, A.E. Duk and A.Kh. Buykis, Institute of Microbiology imeni Avgust Kirkhenshteyn, Latvian SSR Academy of Sciences]

[Abstract] Double stranded RNA (dsRNA) was tested for its efficacy in the management of acute viral infections in calves in doses of 0.025-0.100 mg/kg, administered by various routes. The interferon inducer was found to be non-toxic, with the highest serum-interferon titers of 1:128 obtained with intravenous administration of dsRNA. The serum levels of interferon obtained with

intravenous administration of dsRNA. The serum levels of interferon obtained with intraperitoneal, intramuscular and intranasal administrations were, respectively, 1:64, 1:32 and 1:8. Intravenous administration of 0.075 mg/kg dsRNA 3 times at 24 h intervals to 1-7 day-old calves with acute gastrointestinal diseases led to recovery within 4 days, vs. a control period of 7 days. Administration of dsRNA, according to the same schedule, to 3-month-old calves at the outset of an outbreak of acute upper respiratory infection at the farm similarly reduced the duration of the disease to 4 days, against a 7 day course in untreated animals. Finally, treatment of 1-month old calves with 0.05 mg/kg dsRNA intravenously or intranasally on the 1st, 2nd and 5th day after arrival at a fattening farm with a prevalence of bronchopneumonia resulted in full protection. Unprotected animals display a 27% morbidity incidence. In addition, the dsRNA-treated animals gained 60.7 kg after 2 months, vs. 50.2 kg for the control animals. References 4 (Russian).

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## CONFERENCES

### FIRST ALL-UNION CONFERENCE ON NEUROPEPTIDES: THEIR PHYSIOLOGICAL AND PATHOLOGICAL SIGNIFICANCE (Tomsk, November, 1985)

Yerevan NEYROKHIMIYA in Russian Vol 5, No 3, Jul-Sep 86 pp 333-336

[Article by R.I. Kruglikov and A.V. Azaryan]

[Abstract] The 1st All-Union Conference on "Neuropeptides: Their Physiological and Pathological Significance" was held in Tomsk, on November 19-20, 1985. The conference was organized by the All-Union Cardiological Center and its Siberian Branch. The conference was attended by specialists from across the USSR, and concentrated on three main areas of neuropeptide research and developments: synthesis and metabolism, significance in physiology and pathology, and clinical applications. Although presented on their own, the clinical studies demonstrated the clinical efficacy of a variety of the peptides and thereby substantiated the need for more in-depth studies on the properties and effects of these agents. Theoretical studies on structure-activity relationships may be used as the starting point for modification of natural neuropeptides and synthesis of analogs that may have better-defined clinical applications.

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DEVELOPMENT AND STRUCTURE OF SOME FOULING COMMUNITIES IN AVACHA BAY

Vladivostok BIOLOGIYA MORYA in Russian No 5, Sep-Oct 86  
(manuscript received 11 May 84) pp 20-27

[Article by V.V. Oshurkov, Kamchatka Division of the Institute of Marine Biology, Far Eastern Scientific Center, USSR Academy of Sciences, Petropavlovsk-Kamchatskiy]

[Abstract] The first experimental investigation of the succession and structure of fouling communities on Western Kamchatka shelf is reported. Biological material was collected on three sites in Avacha Bay using 100x100 mm plates secured at 1, 3.5, 6, 8 and 1½ meter depth. In addition, 24 plates were set inside a sunken ship. Samples were collected every month. Over 50 species of bottom nonvertebrates were identified, among which three were highly predominant: mussel *Mytilus edulis*, barnacle *Balanus crenatus* and hydroid *Obelia longissima*. The organisms of meiobenthos were weakly represented; ciliated worms, ostracodes, acarids were absent as well as nematodes, oligochaetes, and gorpacticides. In multiyear fouling, large crustaceans were present (*Telmessus cheiragonus*, *Paralithodes* spp., *Dermaturus mandtii*, *Metridium senile*). In the surface layer during the first half of summer mainly hydroids were formed; closer to estuaries--where salinity was lower--barnacles were found. Due to high elimination of mussels and large growth of hydroids, there was no change observed in the stages of the succession of macrofouling. Figures 3; references 20: 17 Russian, 3 Western (1 by Russian authors).

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## FOULING OF STATIONARY ANCHOR CHAINS BY EDIBLE MUSSELS IN VOSTOK BAY (SEA OF JAPAN)

Vladivostok BIOLOGIYA MORYA in Russian No , Jul-Aug 86  
(manuscript received 20 May 85) pp 29-35

[Article by V.A. Brykov, M.Zh. Chernyayev and S.V. Blinov, Laboratory of Invertebrate Ecology and Breeding, Institute of Marine Biology, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok]

[Abstract] Studies were commenced in May 1981 on the fouling of fixed, steel anchoring by edible mussels (*Mytilus edulis*) chains in the Vostok Bay of the Sea of Japan. Measurements taken at different depths (3, 6, 9 and 12 m) after one year demonstrated an inverse relationship between depth and biomass, population density, and productivity (= rate of biomass increase in  $\text{g/m}^2\cdot\text{yr}$ ). The maximum values were seen at a depth of 3 m, and corresponded to 45,800  $\text{g/m}^2$ , 29,400/ $\text{m}^2$  [specimens], and 45,880  $\text{g/m}^2\cdot\text{yr}$ , respectively. The lowest values were obtained at 12 m, corresponding to 24,820  $\text{g/m}^2$ , 8100 spec  $\text{m}^2$ , and 24,820  $\text{g/m}^2\cdot\text{yr}$ . After a 2 year period of fouling the maximum biomass (49,150  $\text{g/m}^2$ ) was observed at 6 m, and the highest density at 9 m (4,460 spec  $\text{m}^2$ ). Biomass increase was observed at only those 2 depths, characterized by respective productivity figures of 13,270 and 14,490  $\text{g/m}^2\cdot\text{yr}$ . At both time periods, however, maximum shell length and weight was obtained at 9 m after 1 and 2 years. Figures 1; references 14: 8 Russian, 6 Western.

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